ANNUAL MANAGEMENT REPORT YUKON AREA, 1988

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PREFACE

This report presents current and historical information concerning the management of commercial and subsistence fisheries in the Yukon Area. Data from a number of research projects are included in this report; complete documentation of these projects and results are or will be presented in separate reports. Data presented in this report supersedes information found in previous management reports. An attempt has been made to correct errors in previous reports and previously unrecorded data have been incorporated into this report. The report is organized into the following major sections:

1. Area Introduction. This section presents a description of the area, fishery resources, fisheries and management practices.

2. Area Report, 1988. This section presents a comprehensive report of the current year and makes comparisons with previous years.

In order to facilitate use of this report, tabular data has been separated into current year tables and appendix tables where annual comparisons are made.

The following is an explanation of how commercial fishing effort and catch per unit effort data, presented throughout this report, have been derived:

Boat (or fisherman) hours have been computed, arbitrarily assuming that if a fishing boat delivers in any fishing period, it fished the entire period for as many hours as were open to commercial fishing.

Catch per fisherman (or boat) hour is obtained by dividing the total fishermen hours into the catch for the corresponding period of time.

Total fishermen (or boats) is the total number of fishermen making deliveries, regardless of how many deliveries were made or days fished during a particular "season". There are a number of fishermen who deliver only once or twice during the entire season. "Total days fished" is the total number of hours open for commercial fishing during the season divided by 24.

Historic catch trends of total utilization are documented in Appendix Table 1. Annual Management reports prior to 1987 identify the catch as being taken for commercial or subsistence use, as well as total utilization.

AREA INTRODUCTION

Description of Area and District Boundaries

The Yukon management area includes all waters of the Yukon River and its tributary streams in Alaska and all coastal waters from Canal Point Light near Cape Stephens southward to Naskonat Peninsula (Figure 7). The Yukon River is the largest river in Alaska, draining approximately 35 percent of the state, and is the fifth largest drainage in North America (Figure 1). The river originates in British Columbia, Canada, within 30 miles of the Gulf of Alaska and flows over 2,300 miles to its mouth on the Bering Sea, draining an area of approximately 330,000 square miles. With the possible exception of a few fish taken at the mouth or adjacent coastal villages, only salmon of Yukon River origin are harvested in this Area.

There are approximately 10,000-15,000 rural residents in the Alaskan portion of the drainage, the majority of whom reside in 43 small villages scattered along the coast and major river systems. Nearly all of these people are dependent to varying degrees on fish and game resources for their livelihood.

The Alaskan commercial salmon fishery occurs along 1,200 miles of the mainstem Yukon River and the lower 200 miles of the Tanana River. The present district boundaries were originally established in 1961 and redefined in 1962, 1974, and 1978. The commercial fishing area is divided into six districts for management and regulatory purposes (Figure 7). The Lower Yukon Area includes the coastal waters of the area and that portion of the drainage from the mouth to Old Paradise Village, river mile 301 (lower three districts). The Upper Yukon Area is that portion of the drainage upstream of Old Paradise Village to the U.S./Canada Border including the Tanana River (upper three districts). The districts are further subdivided into 10 subdistricts and 25 statistical areas for management purposes. Figures 8, 9, and 10 show the statistical areas for the lower three districts. Figures 11, 12, 13, and 14 show the statistical areas for the upper three districts. Yukon River mileages are listed in Table 2.

Fishery Resources

Five species of Pacific salmon are found in the Yukon River drainage (Figure 1) with chum salmon (Oncorhynchus keta) being the most abundant. It is estimated that chinook (Oncorhynchus tshawytsha), coho (Oncorhynchus kisutch), pink (Oncorhynchus gorbuscha), and sockeye (Oncorhynchus nerka) salmon follow in order of abundance.

Chum salmon are found throughout the Yukon River drainage. Summer and fall chum salmon are two distinct runs of chum salmon which enter the Yukon River. Summer chum salmon are chiefly characterized by: earlier run timing (early June-mid July), rapid maturation in freshwater, smaller size (average 6-7 pounds), and larger population. Summer chum salmon spawn primarily in run-off streams in the lower 500 miles of the drainage and in the Tanana River system (Figures 2, 3, and 4). Fall chum salmon are mainly distinguished by: later run timing (mid July-early September), robust body shape and bright silvery appearance, larger size (average 7-8 pounds) and smaller population. Fall chum salmon spawn in the upper portion of the drainage in streams which are spring fed, usually remaining

ice-free during the winter. Major fall chum salmon spawning areas include the Tanana, Chandalar and Porcupine River systems and also various streams in the Yukon Territory including the mainstem Yukon River (Eigures 4, 5, and 6).

Chinook salmon of the Yukon River are the largest species ranging from 2-90 pounds and averaging 20-25 pounds (sampled from the commercial fishery, large mesh gill nets). Spawning populations of chinook salmon have been documented in the Archuelinguk River located approximately 80 miles from the mouth of the Yukon River and as far upstream as the headwaters of the drainage in the Yukon Territory of Canada, nearly 2,000 miles from the mouth (Figures 2-6). Chinook salmon enter the mouth of the Yukon River soon after ice breakup during late May to early June and continue through mid-July.

Coho salmon enter the Yukon River during late July through mid-September, average about seven pounds in weight and spawn discontinuously throughout the drainage. The major coho salmon spawning concentrations documented to date occur in tributaries of the upper Tanana River drainage (Figure 4).

Pink salmon enter the lower river during late June to mid-July, average approximately 3 pounds in weight and essentially spawn in the lower portion of the drainage (downstream of the village of Grayling) (Figure 2). Pink salmon have been caught in the mainstem Yukon River upstream as far as Ruby (river mile 601). In recent years large runs of pink salmon have occurred during even numbered years i.e. 1984, 1986, and 1988.

Sockeye salmon are uncommon in the Yukon River and only a few individual salmon are caught each year. Sockeye salmon have been reported in the main Yukon River upstream to Rampart (mile 763). There have been reports of sockeye salmon spawning areas being located along the Innoko River drainage.

Pacific herring (Clupea pallasii) are found in Hooper Bay, Kokechik Bay and Scammon Bay (Figure 21). Spawning populations occur primarily in the Cape Romanzof area (Kokechik Bay and Scammon Bay) where suitable spawning habitat consisting of rocky beaches and rockweed (Fucus) is available. Spawning usually occurs from mid-May through mid-June.

Other species common to the freshwater and or coastal marine habitats are listed in Table 1.

Water Quality

Water quality and spawning habitats in the area have been largely preserved in their original condition. Pollution, logging, dam construction and mining activities, except in a few locations, have been to date minimal or nonexistent. It remains to be seen what impact recent oil development activity will have on water quality and fishery resources in the area.

Salmon Fishery History and Description

In excess of one million salmon, mainly chum salmon were taken for subsistence use in some years during the early 1900's, even as recently as 1940 (Appendix Table 1). The first recorded commercial salmon harvest in the drainage occurred

in 1903 when 70,000 pounds of chinook and fall chum salmon were taken in Yukon Territory, Canada. The first recorded commercial salmon harvest in the Alaskan portion of the Yukon drainage occurred in 1918. Relatively large catches of chinook, chum, and coho salmon were made during the first four years of the fishery. The majority of the catch was taken outside of the river mouth since catch restrictions were imposed within the mouth of the river. The early commercial fishery met opposition and was closed during 1925-1931 because of the existence of a large subsistence fishery. Commercial fishing for chinook salmon was resumed at a much lower level in 1932 and a fishery has occurred annually since then. Commercial catches of chum and/or coho occurred during 1918-1921, 1952-1954, 1956 and since 1961.

Alaskan Subsistence Utilization

Comprehensive annual surveys of the Yukon River subsistence salmon fishery were initiated by the Department in 1961. Data obtained cannot be easily compared with that of earlier years which was often incomplete. Methods and coverage of these earlier surveys were not documented and their accuracy cannot be determined.

Subsistence fisheries which target on non-salmon species such as pike, sheefish and whitefish are inadequately documented and their overall significance is not well known. It is thought, however, that residents of the Upper Yukon Area are much less dependent on these miscellaneous species than are their downriver counterparts.

Subsistence fishermen operate gill nets largely in the main rivers and, to a lesser extent, in the coastal marine waters, capturing primarily salmon, whitefish and sheefish. Fish wheels take considerable numbers of salmon in the upper Yukon and Tanana Rivers. Beach seines are occasionally used near spawning grounds to catch schooling or spawning salmon or other species of fish. Traps and fish weirs of various designs are also used, mainly in the fall and winter months, to capture whitefish, blackfish and burbot. Sheefish, pike, char and "tomcod" (saffron cod) are frequently taken through the ice by hand lines. Dip nets are used in late May to early June to take smelt in the delta area and in late October to early November to take lamprey in the main Yukon River downstream of Grayling.

There is usually little intentional wastage of the fish taken for subsistence purposes. The major portion is sun dried or smoked for later consumption while the head and viscera may be fed to sled dogs. Wet weather may cause wastage during the process of attempting to dry fish.

The Department's subsistence fishery surveys (personal interview, catch calendar, and/or catch questionnaires) obtain catch, effort and other associated data from villages and fish camps along the main river in Alaska, including portions of the Tanana River and Chandalar River. Survey methodology and technique has varied from year to year which influences subsistence harvest estimates, however, it is felt that estimates accurately reflect harvest trends. Catch data from the Canadian portion of the drainage has been supplied by personnel of Government of Canada - Department of Fisheries and Oceans (DFO) (Whitehorse office) since 1962.

About 1930, the airplane began replacing the sled dog as mail and supply carrier, starting the gradual reduction of subsistence salmon harvests. During the early to mid 1960's there was an increasing use of snow machines which replaced sled dogs faster than did the airplane. Subsistence catches declined through the 1970's as increased welfare payments and employment opportunities, including commercial fishing activities, became available to rural residents. Declines in subsistence catch levels through the 1970's have varied by species. The reduction was not necessarily related to fish abundance, but likely reflected decreases in effort and dependence due to a changing way of life. Beginning in the early 1980's, due to a renewed interest in sled dog racing, the number of dogs per family has increased in some portions of the drainage, thereby increasing the subsistence salmon harvest. In addition, the human population along the river is increasing, which may result in increased subsistence harvests.

Reflecting the above changes in effort and dependency, the overall subsistence salmon catch has decreased since the early 1960's. The harvest of salmon other than chinook (primarily chum salmon) averaged 416,585 fish during 1961-1965 (reference Yukon Area Annual Management Report, 1985). During the period 1966-1973 catches averaged 209,636 fish, a decrease of 50 percent. However, during 1974-1983, subsistence catches increased, with the catch being utilized mainly for dog food, averaging 364,721 fish during this time period. This increase can be attributed to above average size runs, especially summer chum salmon; reported and unreported subsistence roe sales (legal 1974-1977); and increasing numbers of recreational sled dog teams.

Subsistence catches of chinook salmon, which are utilized mainly for human consumption, remained relatively constant during the period 1961-1977, generally averaging 15,000-25,000 per year. During the 1978-1988 period, chinook salmon catches have increased substantially, averaging approximately 38,600 fish per year (Appendix Table 28).

Subsistence fishing for summer chum salmon declined following the 1966 season. Harvests prior to 1966 were over 300,000 fish annually, while during the period from 1966-1980 harvests were generally under 200,000 fish annually. Documented subsistence catches since 1981 suggest a trend of increasing utilization (Appendix Table 29).

The Upper Yukon and Tanana River subsistence fishery has differed from that in the Lower Yukon due to the limited nature of the Upper Yukon Area commercial fishery and the subsistence use of resources by urban residents. In that portion of the Yukon River drainage upstream of the mouth of the Koyukuk River, fall chum salmon are of more importance for subsistence use than summer chum salmon. It is estimated that fall chums comprise 60-75% of the total subsistence harvest in this area. The total number of subsistence users in the Upper Yukon Area is slightly more than twice that of the Lower Yukon Area. The majority of the subsistence salmon catches are taken in the Upper Yukon River Area which is illustrated by the catch data presented in Appendix Tables 27-31.

It should be noted that the practice of keeping sled dogs is much more common in the Upper Yukon than in the delta area and is considered a major factor affecting subsistence use. It is also likely that the sale of subsistence-caught salmon roe

(legal from 1974-1977) increased subsistence chum salmon catches above normal food and domestic use requirements during that period. Subsistence roe sales were not considered a significant factor affecting domestic use harvests in the twelve major villages in the Lower Yukon River Area.

Due to changes in the state subsistence law which limited subsistence hunting and fishing to rural Alaskan residents, the Board of Fisheries created personal use salmon fisheries in the Yukon Area for non-rural residents of the state. In the Yukon Area, these regulations primarily affected the greater Fairbanks area. Initially, only a fall chum salmon personal use fishery was implemented in 1987. Beginning in 1988, personal use fisheries were created for all salmon. Personal use fisheries are regulated much the same as subsistence fisheries except that salmon taken for personal use may be used only for human consumption and bait. In addition, personal use fishermen are required to obtain a fishing permit from ADF&G and to possess a resident sport fishing license. Typically, personal use catches are included with subsistence harvests in this report.

Alaskan Commercial Utilization

The relatively recent development and expansion of the commercial salmon fishery has enabled many area residents to obtain a cash income. The cash income in many cases provides a means for the area residents to maintain a subsistence life-style. Income earned from commercial fishing is often used to obtain hunting and fishing gear (such as boats, outboards, etc.) utilized for subsistence activities. In recent years (1978-1987), commercial fishermen have received approximately 7.0 million dollars annually (Appendix Table 24). The majority of commercial fishermen are residents of the Yukon River drainage (Table 5).

Most fishermen operate small outboard powered skiffs of 18 to 24 feet in length and do not use gill net rollers or power reels of any type. In recent years, there has been a large increase in the use of VHF and CB radios as well as fish finders which has increased the efficiency of the fleet.

The majority of the salmon catch is presently processed as a fresh/frozen product in contrast to earlier years when canning and salting were of greater importance (Appendix Table 23). Salmon are processed at shore-based or floating operations with a portion of the catch transported via aircraft outside the area for processing. In the Upper Yukon Area, production of salmon roe (purchased directly from fishermen) has increased in recent years (Appendix Tables 3 and 4).

Chinook Salmon

During the 1954-1960 period, a 65,000 chinook salmon quota was in effect for the river. Of this total, not more than 50,000 could be taken below the mouth of the Anuk River, 10,000 in the area between the mouths of the Anuk and Anvik Rivers and 5,000 upstream from the Anvik River. During these years, fishing was allowed for five and one-half days a week until specific quotas were obtained. The average chinook salmon catch for this period was 65,092 fish.

Under new regulations established by the Department in 1961, the annual chinook salmon commercial harvest for the entire area averaged 104,280 fish for the period 1961-1970 (Appendix Table 2). This average was a 60% increase over the 1954-1960 period. During the period 1971-1976 catches declined, averaging 88,067 fish annually because of below average runs (except 1971) and regulatory restrictions. In 1975 the chinook salmon commercial catch of 63,838 was the smallest since 1960.

During the late 1970's, chinook salmon commercial catches began increasing. Due to increased efficiency of commercial fishermen and in some years due to above average run strength, chinook salmon commercial catches ranged from 96,757 to 158,018 fish during 1979-1987, averaging 134,362 fish annually. The largest commercial catch (158,018) area was in 1981.

Summer Chum Salmon

Since statehood the Yukon River commercial chum salmon fishery has steadily developed as subsistence harvests declined, especially during the 1970's. During the period 1961-1965, commercial catches averaged 25,448 while during the same period subsistence chum salmon catches averaged 416,585. During the period 1966-1970, subsistence catches decreased, averaging 217,951 chum salmon. As the subsistence fishery declined and regulations were relaxed, coupled with the expansion of the fall chum salmon commercial fishery, the commercial catches increased, averaging 145,505 fish during 1966-1970. The development of the summer chum fishery and expansion of the upriver commercial fishery resulted in commercial chum catches averaging 644,320 fish during the period 1971-1977. Beginning in 1978, in response to unfavorable chum salmon market conditions, the commercial fishery in the Upper Yukon Area became primarily a salmon roe fishery. This fishery, in conjunction with the previously established fishery, resulted in total commercial harvests during the period 1978-1987 averaging 974,109 fish in-the-round and 156,318 pounds of salmon roe. The largest chum salmon catch in the history of the Yukon River commercial fishery occurred in 1981 when 1,473,389 fish and 200,353 pounds of salmon roe were taken (Appendix Tables 3 and 4).

Since the recent development of the summer chum commercial fishery, catches during the summer return have averaged 724,267 fish and 150,648 pounds of roe annually during the period 1978-1987. The majority of the harvest takes place in Districts 1, 2, (fish in-the-round only), and 4 (primarily roe). The Yukon River summer chum salmon commercial harvest increased sharply as a result of regulation changes (e.g. mesh size specifications and earlier openings of the fishing season), increased fishing effort (including expansion of the Upper Yukon Area fishery), the availability of processing and tendering facilities, higher prices paid to fishermen, the development of Japanese markets, and the occurrence of several very large runs during recent years.

Fall Chum and Coho Salmon

The commercial fishery for fall chum salmon in the Yukon River began in the early 1960's. During the 1961-1968 period, catches averaged 36,185 fish annually and since 1969 (1969-1987) catches have averaged 231,756 fish. Salmon roe sales by commercial fishermen began in the Upper Yukon Area during 1978 and have averaged 5,670 pounds annually (1978-1987) (Appendix Table 4). Fall chum salmon are in

demand and are harvested in all fishing districts because of their good quality (bright, silvery appearance, large size, robust body shape and high oil content), which is related to their destination to spawning areas in the upper portion of the drainage. The majority of fall chum salmon commercial catches are taken in the lower two districts (Appendix Table 4). The largest fall chum catch occurred in 1981 when 466,451 fish and 11,285 pounds roe were taken.

Coho salmon returns to the Yukon River are of lesser magnitude than fall chum salmon and are taken incidental to the commercial fishery for fall chums. Coho catches have averaged 31,997 fish during the period 1977-1987 (Appendix Table 5).

Commercial salmon catches by district and/or statistical area since 1961 are presented in Appendix Tables 2-6, 9, 10, and 16-18.

Alaskan Fishery Development

Lower Yukon Area

Since the onset of the commercial salmon fishery in 1918, the majority of the Yukon River harvest has occurred in the lower river area (primarily Districts 1 and 2) where fishing and processing effort is concentrated and flesh quality is optimal. Historically, the Lower Yukon Area was primarily managed for the harvest of chinook salmon. In recent years, increased fishing effort has been directed toward the harvest of summer chum salmon. The lower river fishery during June is now managed for the harvest of both chinook and summer chum salmon. Set and drift gill nets are the legal gear types in the Lower Yukon Area.

Beginning in 1961, when chinook salmon catch quotas were eliminated for Districts 1 and 2, and continuing through 1981, these fisheries were regulated by scheduled weekly fishing periods with the season opened by a published regulatory date. Fishing time during the chinook salmon season was allowed for four days a week during 1961-1967, but was reduced to 3-1/2 days a week beginning in 1968, to 3 days a week in 1974 and to 2-1/2 days a week in 1977. Beginning in 1981 a 60,000 to 120,000 chinook salmon guideline harvest range was established for Districts 1 and 2 (Appendix Table 15). Effective for the 1982 season, fishing periods during the chinook salmon season in Districts 1 and 2 were established by emergency order. This was done to provide for adequate chinook salmon escapements in response to increasing fishing effort and efficiency. The "chinook salmon season" (unrestricted mesh size) in these districts usually opens by emergency order between June 5-15 and is closed by emergency order during late June or early July depending on run timing and magnitude. From 1982-1986, fishing periods of 24 hours duration generally occurred twice weekly. During 1987, 12-hour periods were introduced and during 1988 all unrestricted mesh size periods were 12 hours in duration.

Commercial fishing effort increased sharply during 1961-1975, with license registration for set gill nets more than doubling while drift gill net gear tripled during this period. Set gill nets are commonly used near the river mouth, but drift gill nets are the predominant gear type elsewhere. The best measurement of effort is the number of units of commercial fishing gear operated

each year since fishermen have commonly used more than one type of gear during the season (Appendix Tables 7 and 8). With the advent of the Commercial Fisheries Limited Entry (CFEC) program in 1976, fishing effort in terms of the number of participants stabilized, but efficiency increased. From 1976-1987, an average of 705 CFEC gill net permits have been issued annually (Appendix Table 7).

During 1976-1980, prior to establishment of the 60,000-120,000 guideline harvest range, chinook salmon commercial harvests in Districts 1 and 2 averaged 102,885 fish. For the period 1981-1987, District 1 and 2 chinook salmon harvests averaged 123,755 fish.

In District 3, a 1,800-2,200 chinook salmon guideline harvest range was established in 1979. The commercial salmon fishing season in District 3 opens by emergency order. Fishing is allowed under a schedule similar to Districts 1 and 2. Since 1979 the District 3 catch has averaged 3,285 fish annually (1979-1987).

Sale of other species of salmon captured during the chinook salmon season, excluding the 1920's, has been allowed only since 1967 in the area of the present lower two districts. The incidental catch of summer chum salmon was limited during the chinook salmon season as fishermen could use only gill nets of eight inch minimum stretched mesh. However, beginning in 1970, each fisherman could substitute up to 50 fathoms of gill net of any mesh size in Districts 1 and 2. In 1973 all mesh size restrictions were lifted during the chinook salmon season (from June 1 through early July) in order to allow greater opportunity to use small mesh nets which are selective toward the more abundant summer chum salmon. The majority of fishermen continue to fish the larger mesh chinook salmon nets during periods allowing unrestricted mesh size. Comparative Lower Yukon Area chinook and summer chum salmon catches by mesh size are presented in Appendix Table 11.

The Alaska Board of Fisheries liberalized regulations during the 1970's to provide for harvest of summer chum salmon surplus to subsistence and escapement requirements. A regulation was promulgated in 1973 which specified that gill nets of six inch mesh size or less could be fished after a specified date in early July in Districts 1 and 2. Use of small mesh gill nets in early July allowed a greater harvest of summer chum salmon and also minimized the chinook salmon catch during the end of the chinook run (Appendix Table 11). Beginning with the 1976 fishing season, a regulation was promulgated which established a flexible range of dates from June 27 to July 5 in Districts 1 and 2, and July 5-15 in District 3, after which only gill nets of six inch maximum mesh size may be used. Effective for the 1985 fishing season, a regulation was promulgated which eliminated specific dates and implemented emergency order authority in establishing restricted mesh size periods (six inch maximum mesh size) in Districts 1, 2, and 3. Additionally, the Board of Fisheries issued a directive to the Department to provide for special summer chum salmon directed fishing periods (6 inch maximum mesh size) prior to the end of the chinook salmon season if the summer chum salmon run was average or better in strength.

In recent years (1979-87) the Lower Yukon Area commercial summer chum salmon catch has averaged approximately 603,350 fish annually (Appendix Table 3).

Since 1961, with the exception of the 1987 season, the commercial fishing season in the lower Yukon districts has been reopened following the closure of the chinook salmon season to allow harvest of fall chum and coho salmon.

Prior to 1973, the closure between the chinook salmon (summer) and the fall chum /coho salmon (fall) seasons (often during late June and most of July) was primarily for the purpose of insuring an adequate supply of summer chum salmon for upriver subsistence fishermen. This closure also provided protection for the late stages of the chinook salmon run.

A 200,000 fall chum salmon quota (after mid-July) was implemented for the combined lower three districts in 1974. Also, fishing time was reduced from four to three days a week in Districts 1 and 2. These actions were necessary to stabilize the catch in view of increased fishing effort and improved efficiency, and to provide for a harvest in the newly established Upper Yukon Area fishery. In 1979, fishing time was reduced further to two days a week and the 200,000 quota was replaced by a flexible guideline harvest range of 120,000-220,000 fall chum salmon.

Effective beginning in 1983, fishing time has been regulated by emergency order in Districts 1, 2, and 3. From 1983 though 1985, two twelve hour fishing periods per week were established by emergency order in Districts 1 and 2, except that fishing time remained at two days a week for set net fishermen in the coastal area of District 1 (Figure 15). Fishing time in District 3 was reduced from 3 to 2 days a week. Also a 7-10 day season closure in Districts 1, 2, and 3 during late July was established. Fishing time was further restricted for the 1986-1988 seasons by regulation through implementation of the Yukon River Fall Chum Salmon Management Plan in anticipation of poor returns of fall chum salmon during those years. A season closure of July 15 was established to protect the early portion of the fall chum salmon run and to provide the Department an opportunity to evaluate run strength. Additionally, the guideline harvest range was reduced to 0-110,000 fall chum salmon for Districts 1, 2, and 3. The commercial fishery was opened by emergency order authority. Under this management plan there was a possibility of no commercial fall chum fishery as occurred during 1987. During 1986 and 1988, based on the assessment of in-season run strength, fishing period duration was restricted from that of previous years. Lower Yukon Area fall chum salmon catches since 1970 range from 131,313 to 341,760 fish, with the exception of 1986 through 1988 seasons when the harvest ranged from 0 to 113,400 fish (Appendix Table 4).

The harvest of coho salmon in the Lower Yukon Area is incidental to the harvest of fall chum salmon, with the season closing after an appropriate harvest of fall chum salmon occurs. The coho salmon run peaks during mid to late August in the lower river. Lower Yukon coho salmon catches averaged 31,700 fish annually from 1978-1987 (Appendix Table 5).

Nearly all of the lower Yukon River salmon catch is destined for markets as a fresh-frozen product. Freezer ships and barges are located in the vicinity of Emmonak. Fresh salmon is transported by aircraft from St. Marys and Marshall annually, and from Russian Mission and the Paimuit-Holy Cross area during some seasons for further processing. Beginning in 1988, with the opening of a new,

longer runway in Emmonak, fresh salmon have been flown out from this village also. A hard salting operation is located at Black River.

Upper Yukon Area

Prior to 1974, the Upper Yukon Area (above the confluence of the Koyukuk River) was designated as a single district (District 4). By regulation, commercial fishing was allowed 7 days per week until the quotas of 2,000 chinook salmon and 2,000 chum and coho salmon (combined) were taken. These quotas were established for the purpose of allowing a very limited commercial utilization which had occurred for many years. Fish wheels and set gill nets are the legal gear types for commercial fishing in the Upper Yukon Area.

In recent years, however, the upriver commercial fishery has expanded. Fishing effort nearly doubled from 1972 to 1973, and processors developed outside markets, due in part to the steadily increasing price of salmon the market was experiencing. In recognition of the developing upriver commercial fishery and the desire of fishermen in the upper portion of the drainage to achieve increased participation, the Alaska Board of Fish and Game adopted several major regulation changes prior to the 1974 fishing season. These regulations provided for substantial increases in the upriver catches, reduced gear conflicts, and made provisions for allowing escapement needs to be met. These regulations included:

1. District 4 was reduced in size and redefined as that portion of the Yukon River drainage from the mouth of the Bonasila River to the mouth of Illinois Creek at Kallands.

2. Two new districts, 5 and 6, were added.

3. Salmon catch quotas were established for the Upper Yukon Area as follows:

    a. District 4: 1,000 chinook salmon and after August 15, 10,000 chum and coho salmon combined for the area.

    b. District 5: 3,000 chinook salmon and after August 15, 25,000 chum and coho salmon combined for the area.

    c. District 6: 1,000 chinook salmon and after August 15, 15,000 chum and coho salmon combined for the area.

4. In Districts 4, 5, and 6 the weekly commercial fishing period was reduced from 7 to 5 days per week.

Since that time, the Alaska Board of Fisheries has enacted a number of major regulation changes in the Upper Yukon Area:

1. Weekly fishing periods were reduced in all districts (except the upper portion of District 5) from 5 to 4 days per week, and split-period (two 48 hour periods) fishing schedules were established. In District 4, the commercial fishing season opened by emergency order between June 10 and June 25.

2. Chinook salmon and fall chum and coho salmon quotas were replaced by flexible guideline harvest ranges: District 4: 2,250-2,850 chinook salmon and 0-20,000 fall chum and coho salmon combined; District 5: 2,700-3,300 chinook salmon and 0-20,000 fall chum and coho salmon combined; and District 6: 600-800 chinook salmon and 0-10,250 fall chum and coho salmon, combined.

3. District 4 boundaries were redefined and new subdistricts created to allow for stock-specific management of fall chum and coho salmon.

4. New subdistricts within District 5 were created to achieve more balanced harvests and escapements.

In the spring of 1988, the Alaska Board of Fisheries met in special session to take public and staff testimony on proposed salmon management practices on the Tanana River. During this special session, the Board adopted regulations which:

1. Reduced allowable commercial and subsistence fishing time from two 48 hour periods per week to two 42-hour periods per week.

2. Specified that there be no more than one 42-hour commercial fishing period per week during the fall season.

3. Minimized abuse in the subsistence fishery by requiring subsistence fishing permits, catch limits, and in-season reporting requirements.

4. Expanded rights of inspection of processing plants by enforcement personnel.

The Board further instructed the staff to manage the fishery on the basis of existing guideline harvest ranges, indicating that these guidelines are to be exceeded only if it can be determined that doing so would not jeopardize escapements or spawning ground requirements.

Because of the common origin of salmon stocks which are harvested throughout the length of the Yukon River, the commercial and subsistence fisheries in the middle and upper river districts cannot be considered separate or distinct from those in the lower portion of the drainage.

For reasons of relative abundance, flesh quality, and the existing regulation structure, the chinook and fall chum salmon runs are the target species of the commercial fishery in Districts 5 and 6.

The summer chum salmon run is of paramount importance in District 4 and comprises the majority of the total upriver commercial harvest (78% of fish sold in the round, 98% of roe sales). Relatively few summer chum salmon are taken commercially in Districts 5 and 6. In the Upper Yukon Area, summer chum salmon flesh is difficult to market because of the relative high cost of transporting fish to market, and their advanced state of sexual maturity and consequent poor quality; however, roe quality of summer chums is judged by the industry to be excellent.

Fish wheels are the primary type of gear for harvesting summer chum salmon because of local fishing conditions, efficiency, and relative ease of operation. Fish wheels account for roughly 95% of the commercial harvest of this species in the Upper Yukon Area.

The major difference between the Lower and Upper Yukon Area fisheries is their relative size, both in numbers of fishermen and catch. Overall, there is a lower abundance of fish available for harvest the further upriver a fisherman is located from the mouth because of the migration of fish into tributary streams and harvests downriver. The Upper Yukon Area commercial salmon harvest has averaged approximately 12% of the total area harvest of fish sold in the round and 100% of the roe sales (1982-1988). During the same time period, the Upper Yukon districts have had an average of 152 participating fishermen or approximately 19% of the Yukon area total (Appendix Table 7).

Chinook salmon are of lesser importance to the commercial fisheries in the three upper districts; the total harvest guideline range allocated by the Alaska Board of Fisheries is 5,550 to 6,950 chinook salmon (Appendix Table 15). The guideline harvest range is not met in District 4 during most years, as most fishermen choose to retain chinook salmon for subsistence use. In the Tanana River (District 6), the upper end of the chinook salmon guideline harvest range is normally taken by late July, and in most years the season remains closed until early to mid-September. A relatively intense fishery for chinook salmon has developed in the lower portion of District 5, and considerable (gill net) effort occurs during July.

The majority of commercially caught chinook salmon are transported to Fairbanks and other population centers for primary processing and sold to wholesalers outside the state as a fresh/frozen product. The balance of the chinook salmon catch is sold to local supermarkets and restaurants. Most fall chum salmon harvested in these districts are tendered by boat or single-engine aircraft from collection points along the river and are subsequently trucked or flown to processing plants in Manley, Galena, or Nenana for processing. A portion of the fall chum harvest is marketed as a fresh/frozen product, and small quantities of chinook and fall chum salmon are smoke-cured and sold as "strips", a local specialty product. In addition, limited undocumented quantities of chum and coho salmon taken commercially are dried and sold as dog food.

The Upper Yukon Area commercial fishery developed at a time (mid to late 1970's) when salmon runs on the west coast were generally depressed. For this reason, processors were able to overcome quality problems and transportation costs and find ready markets for their product. In recent years, however, salmon runs throughout Alaska have rebounded, and processors must compete with higher quality sockeye and chum salmon. Prices paid for upriver chum salmon (primarily summer chum salmon) have not kept pace with inflation. This has resulted in the development of salmon roe sales beginning in 1978.

To varying degrees between years and districts, markets for chum salmon in-the-round remain available for higher quality male summer chum salmon and fall chum salmon (Appendix Tables 3, 4, and 6). Carcasses resulting from roe extraction appear to be fully utilized for subsistence purposes except for District 4 summer

chum harvests since 1980. Total utilization of District 4 summer chum salmon harvests have been estimated since 1980 based on fish ticket sales (either in the round or as roe), estimated sex ratio as documented by the Department operated fish wheel located near Kaltag from 1983 to 1985, subsistence survey results, and estimates of average roe weight per female chum salmon. It is estimated that approximately 336,000 summer chum salmon were harvested annually from 1982-1987 in District 4 in association with the commercial fishery. It was estimated that the harvest of summer chum salmon in District 4 in 1988 was 490,074 (Appendix Table 6). A portion of the carcasses resulting from this catch is utilized for subsistence (primarily for dog food), however, significant wastage is suspected.

Canadian and Marine Harvests of Yukon River Origin Salmon

Canadian

Records of Canadian commercial utilization of Yukon River origin salmon indicate a fishery occurred sporadically from 1903 to 1917 and continuously from 1918 to 1947. No harvest records are available from 1948 to 1957 (Appendix Table 1). Since 1958 harvest records document the annual catch by species, and since 1961, by user group. The average Canadian chinook and fall chum salmon harvest during the most recent five years (1984-1988) were 8% and 31% respectively greater than the previous five year average (1979-1983). During recent years, while U.S. commercial fall chum harvests were restricted in order to provide for conservation of depressed spawning stocks, Canadian commercial fishermen were taking record and near record catches.

U.S./Canada - Treaty Negotiations

In the spring of 1985, the governments of the United States and Canada ratified the Pacific Salmon Treaty; although Yukon River fishery issues are not specifically addressed in this document, one provision of the treaty required the two countries to begin negotiations regarding Yukon River salmon stocks which originate in Canada.

Since that time, U.S. and Canadian delegations have met in briefing sessions and in five formal negotiation sessions. The U.S. delegation is composed of a Department of State attorney acting as Chief Negotiator or his alternate, representatives of the Department of Fish and Game, United States Fish and Wildlife Service (USFWS), and National Marine Fisheries Service (NMFS), and 14 members of the public who represent subsistence and commercial fishing interests on the Yukon River.

Little progress has been made in these negotiations because of sharp differences on questions whether a Yukon River agreement should be part of the Pacific Salmon Treaty and, more specifically, on questions of salmon allocation between the two countries.

One benefit of these negotiations is the formation of a Joint Technical Committee composed of fishery scientists from both nations. The work of this committee is

resulting in the development and exchange of important fishery data and a better understanding of salmon conservation requirements.

High Seas Salmon Gill Net Fisheries

Chinook salmon of western Alaska origin have been intercepted yearly by the Japanese mothership and landbased gill net fisheries (Appendix Table 39). Revised estimates indicate an average of 141,000 chinook salmon were taken during 1975-1983. Yukon River chinook salmon comprised the majority of western Alaska stocks taken in the Bering Sea mothership catches. In 1980 a total of 438,000 western Alaska chinook salmon was estimated to have been taken in these fisheries which exceeded the domestic commercial catch in western Alaska for that year.

Although reported foreign catches have decreased in recent years, it is believed that high seas fishing mortality including gill net dropouts (estimated to be 30% of the reported catch in one study) and possible under-reporting of catches result in continued losses of western Alaska fish.

The 1988 catch of chinook salmon by the Japanese mothership and land based gill net fisheries was 26,000 fish and 47,000 fish, respectively. Estimates of the numbers of western Alaska chinook salmon in these harvests are not available.

Foreign, Joint Venture, and U.S. Domestic Groundfish Fisheries

Information on 1988 incidental salmon catches in offshore fisheries is not complete as these fisheries are still in progress. In 1987, foreign and joint venture groundfish fisheries captured 3,305 and 10,632 salmon (all species) in the Bering Sea and Aleutian Islands area, respectively (Appendix 15). Only 137 salmon were reported for the joint venture fishery in the Gulf of Alaska during 1987 (Appendix 16).

Continued concern exists over large foreign trawl fisheries operating in international waters ("doughnut" area) of the Central Bering Sea. It is speculated that the total groundfish catch of all nations in this area may exceed 1,000,000 m.t. Since there are no international agreements that require observer coverage on this fleet, the incidental catch of chinook salmon, which are known to be in this area, is unknown.

Due to the lack of an observer program, the numbers of salmon taken by the U.S/domestic groundfish fleet is also not known. This is of concern since the U.S. groundfish fishery is rapidly expanding with 400,388 m.t. taken in 1987. This catch represented 22% of the total groundfish catch of all nations in the Gulf of Alaska and Bering Sea-Aleutian areas in 1987. The U.S. groundfish catch in 1986 was 143,300 m.t. or only about 8% of the total groundfish catch by all nations in these areas.

Alaska Peninsula

The majority of salmon captured during June in the Unimak and Shumagin Islands area, located on the south side of the Alaska Peninsula, are bound for terminal fisheries in the northern gulf of Alaska and the Bering Sea, including the Yukon

River. The stocks contributing to this fishery have been described by several tagging studies, including a tagging study in 1987 and a 1983 scale pattern analysis study. Sockeye salmon is the target species in the June fishery, but relatively large incidental catches of chum salmon are made. The sockeye salmon harvest is regulated by a quota that is annually adjusted according to the Bristol Bay sockeye salmon forecast. A 400,000 chum salmon quota was also in effect during 1986, but was not extended by the Alaska Board of Fisheries to the 1987 fishery. However, the Board adopted a 500,000 chum salmon quota for the 1988 and 1989 fisheries. A total of 759,500 sockeye and 513,000 chum salmon was taken in the June 1988 fishery. The previous 5 and 10 year average chum salmon harvests by this fishery are both approximately 480,000 fish.

Norton Sound

A commercial harvest of 4,096 chinook salmon was taken in coastal Norton Sound waters in 1988. Some Yukon River chinook salmon are known to be intercepted by this fishery. The previous 5 and 10 year average harvests were 10,300 and 9,200 fish, respectively.

Escapement Enumeration

An essential requirement in management of the Yukon River salmon fisheries is the evaluation of annual salmon spawning escapements. Knowledge of escapements is necessary for several reasons directly applicable to fisheries management:

1. Provides information for determining optimum escapement levels or goals for selected spawning areas or management units.

2. Provides annual escapement trends for evaluation of the effectiveness of the management program and, in turn, the basis for proposing regulatory changes and management strategies.

3. Provides information for use in projecting returns.

The Yukon River drainage is too extensive for comprehensive escapement evaluation of each spawning area. Therefore, the department has employed a system of escapement evaluation which utilizes information from a variety of sources. Near Pilot Station, a sonar project has been conducted in the mainstem Yukon River annually since 1985 which counts fish on a statistically designed sample plan as fish pass the sonar site (river mile 123). A test net program is conducted in conjunction with sonar enumeration to apportion the counts of fish by species. The sonar estimates of fish passage beyond the sonar site are compared between years as an index of abundance. This information is used on a daily basis for lower river fisheries management. Enumeration of chinook salmon stocks has not been successful to date.

For selected spawning streams, comprehensive enumeration studies are conducted by ground surveys, counting towers, weirs, mark and recovery programs, and hydroacoustic sonar projects. These projects are limited in number, considering the total number of spawning areas, due to the cost of equipping, manning, and operating more sophisticated enumeration projects. Consequently, low-level aerial surveys from single-engine, fixed-wing aircraft are a primary method used

to obtain escapement information. The advantage of aerial surveys is the cost-effectiveness of obtaining escapement information throughout an extremely vast area, most of which is remote. Representative selected spawning streams have been designated as "index areas" and receive highest aerial survey priority. Preliminary escapement objectives have been established for some tributary systems which represent the number of spawners considered necessary to maintain the reproductive potential of each stock (Table 17).

In order to gain greater understanding of escapement requirements and fluctuations in run size by spawning stocks, several specific projects are underway. Stock composition modeling is being utilized for chinook salmon based on scale pattern analysis. In addition, electrophoretic techniques are being used by USFWS in an effort to identify discrete stocks of chinook and chum salmon.

Management

The overall objective of the Yukon Area research and management programs is to manage the various salmon runs and the herring return on an optimum sustained yield basis. Subsistence fishing has been designated by the Alaska State Legislature and the Alaska Board of Fisheries as the highest priority use. The management of the Yukon River salmon fisheries must take a conservative approach to maintain the subsistence priority, and to provide for spawning area escapements to sustain production of the resource.

Management is made difficult by the complexity of the salmon runs and fisheries interception by domestic and high seas fishermen. There is a lack of adequate comparative catch and return data on which to evaluate the long term effects of increased commercial harvests since most of the fisheries have only developed or expanded in recent years. Effective management of the fisheries is difficult due to the variety of user groups, the complexity of multi-stock, multi-species salmon runs and the immense size of the Yukon River drainage. Fisheries distributed over 1,400 river miles harvest stocks of fish that are up to several weeks and hundreds of miles from their spawning grounds. The Yukon River commercial fishery is a mixed stock fishery and as a result some tributary populations may be under or over harvested in relation to their actual abundance. It is impossible to manage stocks separately, based on current knowledge, and there is concern that small spawning populations may be reduced to very low levels.

Accurate in-season assessments of escapements immediately past the intensive downriver fishery are very difficult with the present available technology and funding. In-season management and analysis of catch data are hampered by variable run timing and entry patterns of fish into the lower river fishery.

The two basic regulations used to manage the commercial salmon harvest in the area are emergency order (management order) authority which is used to implement fishing season openings and closures, fishing periods, mesh size restrictions, and guideline harvest ranges. Commercial fishing is normally allowed for a total of from one to four days per week during the open season which depends on the district and species involved. In recent years fishing time in the Lower Yukon

Area has been significantly reduced. Guideline harvest ranges have been established for chinook and fall chum salmon fisheries throughout the drainage.

During the fishing season the salmon return is monitored on a daily basis through management and research programs. In-season data is compared to data from other seasons in relationship to escapements and total harvests during those years. If it becomes apparent that the run is substantially smaller or larger than needed for escapement and subsistence requirements, then the commercial harvest rates can be adjusted through the use of emergency orders. A list of emergency orders dealing with changes in fishing time and other regulations issued for the Yukon Area in 1988 is presented in Attachments 1 and 2. Also presented are 1988 regulation changes promulgated by the Board of Fisheries during its December 1987 meeting and May/June 1988 meeting (Attachment 3).

Research and management projects have been established, and other programs are planned, contingent on additional funding, for obtaining the biological information necessary for better management of salmon runs. During 1988, the following projects were conducted:

1. Test Fishing. Projects located at South, Middle and North Mouths (set and drift gill nets for all salmon) in the delta area and a fish wheel site near Ruby (fall chums and cohos) to determine run timing and to provide an index of abundance for comparisons between years. Contract fishermen operated fish wheels as part of a test fishing project at Manley, Nenana, and Fairbanks on the Tanana River. Additionally, a variable mesh test net program was operated to evaluate abundance and distribution of Pacific herring within Kokechik and Scammon Bays.

2. Side Scan Sonar. Projects to enumerate escapements in Anvik River (summer chums) and Sheenjek River (fall chums). In addition, the USFWS operated a project on the Chandalar River (fall chum salmon).

3. Counting Tower. Project to enumerate escapements in East Fork Andreafsky River (chinook and summer chum salmon).

4. Main River Sonar. BioSonics hydroacoustic equipment operated in the main Yukon River near Pilot Station to obtain in-season estimates of abundance by species. At this time, chum and coho salmon counts are considered fairly accurate.

5. Stock Separation Biology. Catch and escapement scale and tissue samples of chinook and chum salmon were collected throughout the drainage for the purpose of identifying major stocks by scale pattern analysis and electrophoretic technique. These projects may provide the capability for allocating the catch to areas of origin.

6. Data Processing of Commercial Fishery Statistics. Lower Yukon River commercial catch and effort data analysis from fish tickets, obtained by microcomputer at the Emmonak field office, was utilized for in-season management purposes.

7. Aerial Surveys of Salmon Spawning Streams. Aerial surveys to maintain index of escapements of primary streams and to develop additional escapement index areas. Additionally, fall chum salmon foot surveys were conducted in the Tanana River drainage.

8. Tagging Project. To estimate harvest rates and total escapement to upper Yukon River (Yukon Territories, Canada) a salmon tagging project was conducted (chinook and fall chum salmon) by DFO. Additionally, Department mark and recapture projects were conducted on the Chena and Salcha Rivers to estimate total chinook escapement.

9. Radio Tagging. To evaluate fall chum salmon spawning areas in the Tanana River.

10. Herring Spawn Deposition Program. To determine herring abundance in Kokechik and Scammon Bays.

Attachment 4 lists studies undertaken during 1988 and includes a summary of objectives, procedures and preliminary results for each project.

The Division of Commercial Fisheries of the Alaska Department of Fish and Game is responsible for the management of commercial and subsistence fisheries in the state. The permanent staff assigned (full time) to the Yukon area includes six positions - two area management biologists, one assistant area management biologist and three research biologists. In addition approximately 30 seasonal employees are hired each season to assist the permanent staff in conducting various management and research studies. Also, the staff aids in the enforcement of regulations in cooperation with the Division of Fish and Wildlife Protection (Department of Public Safety).

Operating funds allocated by the State of Alaska for the Yukon Area salmon management and research program from July 1, 1987 through June 30, 1988 were $1,072,800; an additional $215,000 was allocated from the Federal Government to address research issues associated with U.S.-Canada salmon negotiations. An additional $25,700 State funds were allocated to conduct herring studies at Cape Romanzof.

In addition to the salmon and herring management and research programs, the staff monitors catches for commercial fisheries on under-utilized species such as whitefish.

A unique challenge in the lower river area is related to language and communication. Many of the older native people cannot read or speak English. Therefore, the staff often uses translators when conducting the many public meetings that are annually held throughout the area. To assist in education and information, special field announcements are broadcast during the fishing season over radio stations KNOM and KICY in Nome and various radio stations in the Fairbanks area.

AREA SALMON REPORT 1988

Area Season Summary 1988

The Yukon River salmon runs in 1988, based on comparable catch and escapement data, were judged to be poor to above average in magnitude depending on the species. In 1988, a total of 1,474,245 salmon were commercially harvested in the Alaskan portion of the Yukon River (Table 4). The catch was composed of 101,421 chinook salmon, 1,152,237 summer chum salmon, 133,975 fall chum salmon and 86,612 coho salmon (Table 4). In addition, 256,535 pounds of summer chum salmon roe and 3,227 pounds of fall chum salmon roe were sold by commercial fishermen. A Department test fish project was initiated in District 6 of the Upper Yukon in 1988. A total of 26,988 fall chum and 13,295 coho salmon were caught by contracted fish wheel operators, and sold, during the project.

The U.S. commercial harvest for all species was 54% above the 1983-1987 average of 956,222 fish; roe production was 34% above the 1983-1987 average. The chinook salmon catch was 22% below the recent 5-year average (1983-1987). The summer chum salmon catch and roe harvest were 1.9 and 1.3 times, respectively, greater than the recent 5-year average. The fall chum salmon harvest in Alaska was 27% below the 1983-1987 average. A record coho harvest was achieved which was 2.2 times greater than the recent 5-year average. In the Canadian portion of the drainage, a record commercial harvest of 13,217 chinook salmon occurred, which was 1.2 times greater than the recent 5-year average. There was an additional commercial harvest of 30,263 fall chum salmon in Canada, 1.1 times greater than the recent 5-year average (Table 4).

Yukon River fishermen in Alaska received an estimated $13,378,700 for their catch, approximately two times greater than the recent 5-year average. The first wholesale value of the 1988 pack was estimated at $33,446,750 (Appendix Table 24). Buyers and processors operating in the Yukon Area during 1988 are listed in Table 3. The majority of the salmon catch was processed primarily as a fresh/frozen product. Commercial salmon and salmon roe production data is presented in Appendix Table 23. Average prices paid to fishermen, and average salmon weights are presented in Appendix Tables 25 and 26, respectively.

In 1988, a total of 787 Commercial Fisheries Entry Commission (CFEC) gill net permits and 161 fish wheel permits (not including transfers) were issued (Appendix Table 7). Table 5 shows the residency of those issued CFEC permits for 1988. The actual number of commercial fishing vessels (fishermen) that made at least one salmon delivery by district during the season are shown in Appendix Table 8.

Combined subsistence and personal use harvests during 1988 in the Yukon Area (excluding Yukon Territory) were estimated at 46,590 chinook, 202,137 summer chum, 159,703 fall chum and 69,138 coho salmon (Table 14). Chinook salmon harvests were very similar to the 1983-1987 average catch of 46,008 fish. Summer chum salmon harvests in 1988 were 22% below the average for the same time period (260,540 fish). An additional 106,801 summer chum salmon harvested in the District 4 commercial fishery were reported to have been used for subsistence purposes. Fall chum salmon harvests were 27% below the 1983-1987 average of 219,986 fish. Coho salmon harvests were 54% above the 1983-1987 average catch

of 44,908 fish (Appendix Tables 28-31). Subsistence harvests taken through the use of permits are summarized in Appendix Table 27 of historical chinook salmon subsistence harvests by village.

Chinook salmon harvest age composition data indicated a larger proportion of 4-year old fish and smaller proportion of 6-year old fish than other years since 1982 (Table 37). The low proportion of 6-year old fish was anticipated due to the low proportion of 5-year old fish observed in the 1987 harvest. The large proportion of 4-year old fish in 1988 may be partially explained by increased use of 6 inch and smaller mesh size during the summer commercial fishing season in the Lower Yukon Area.

Samples collected from summer chum harvests resulted in an age composition of 70% 4-year-olds and 29% 5-year-olds. The results are not atypical for the years 1982-1988. Fall chum salmon samples indicated that age 3, age 4, age 5 and age 6 fish comprised 4%, 46%, 47% and 3% in the harvest respectively. This age composition was similar to 1984, however, typically the proportion of 4-year old fish is much larger. Age 4 coho salmon documented samples taken from Yukon River fisheries as observed in all other years.

Subsistence Fishery 1988

Subsistence salmon catch data have been collected through the use of personal interviews, catch calendars (on which fishermen record daily catches), mail out questionnaires or combinations of all three techniques since 1961. Additionally, in recent years subsistence fishing permit catch information has been available for three sections of the Upper Yukon Area and since 1987, personal use fishery permits have been issued by the Department throughout the Yukon Area. Due to funding limitations, the Department was unable to send survey crews to all villages in 1983 and 1984 to interview fishermen, however, in 1985 personal interviews were conducted in most villages. During 1986-1988, in response to funding provided for US/Canada negotiation support, comprehensive subsistence fishery harvest surveys took place. Commercial Fisheries Division staff conducted all subsistence surveys prior to 1988. Subsistence Division staff conducted the 1988 survey. The objective of having Subsistence Division staff conduct the 1988 survey was to evaluate techniques used by Commercial Fisheries Division and to make modifications to information collection techniques to obtain the best estimates possible.

The basic methodology used by the Subsistence Division was to identify all households in each community. Community household lists were updated during February and March utilizing prior year survey lists of fishing families, village census information, and interviews with key individuals in 31 of the 43 Yukon River drainage communities. Updated community household lists identified 2,536 households in 40 communities of which 1,495 households, or approximately 59%, usually subsistence fished for salmon. Findings indicated that up to 39% additional households subsistence fished for salmon than previously recorded. However, historically, survey lists evaluated households in a broader sense (family units working together to harvest and process salmon), therefore, there is no direct correlation between fishing family and fishing household.

Catch calendars were mailed to approximately 2,700 households in 45 Yukon River area communities, including two coastal communities. Calendars provided space for fishermen to document catch by day by species and were designed to provide information on harvest timing. Catch calendars had an improved format from previous years. Calendars were unique for three broad geographical areas of the Yukon River drainage (lower, middle, and upper). Unique calendars allowed for only those species harvested in the areas to be included on the calendar; for species to be identified by common and local names; and only months during which salmon fishing actually occurs were included on the calendar.

Maps were developed for each community based on aerial photographs, published maps by the Department of Community and Regional Affairs, and the Alaska Village Electrical Cooperative to assist field workers in locating households during post-season surveys.

Subsistence survey personal interviews occurred over a 9 week period beginning on the lower river during the first week of September and ending in Eagle the first week of November. Interviews took one to three days to conduct for each village. Personal interviews were conducted in 39 of the 45 communities. Personal interviews were based upon 16 questions to obtain harvest totals by species, information on household characteristics, gear type, and comments on regulations and issues. Additional questions were asked of fishermen of some communities to gain specific information unique to that community. For instance, in District 4, information was collected for subsistence only fishing harvests and for fish utilized for subsistence from commercial salmon roe sales activities.

On completion of community personal surveys, a questionnaire was mailed to individuals not contacted through the survey or calendar return.

Subsistence harvest permits are required in some communities of the Upper Yukon Area and catch information from permits was used to compile harvest totals. Also, personal use harvests, as currently required by regulation for residents of non-rural communities, are included in the subsistence harvest by community and total.

Lower Yukon Area

During 1988, an estimated 12,286 chinook, 64,056 summer chum; 15,829 fall chum and 13,032 coho salmon were harvested by fishermen representing 475 households for subsistence purposes in the Lower Yukon Area (Table 14). Of these totals, 82 chinook, 505 summer chum and 7 fall chum were taken by 17 personal use permit holders in District 1. The catch of chinook salmon was 27% below the recent 5-year average. Summer chum salmon subsistence use was similar to the recent 5-year average. Catches of fall chum salmon were 39% below the recent 5-year average while coho catches were 9% above the 5-year average. Although chinook and fall chum catches were lower than recent years, historical subsistence catch and effort data indicate an overall trend of increasing subsistence catches. Fall chum and coho salmon catches were probably slightly higher than reported because some fishing occurred after the personal interviews were conducted.

Upper Yukon Area

The 1988 Upper Yukon Area (excluding Canada) combined subsistence and personal use salmon catch was estimated to be 34,304 chinook, 138,081 summer chum, 143,874 fall chum, and 56,106 coho salmon. Catches of chinook, and coho salmon were 18% and 70% above the recent 5-year average, respectively. Summer chum and fall chum salmon catches were 30% and 26% below the recent 5-year average, respectively. A total of 153 personal use fishermen harvested 2,601 chinook, 3,042 summer chum, 4,883 fall chum and 1,308 coho salmon.

The possibility of overestimating the summer chum salmon subsistence harvest in District 4 has been discussed in previous annual management reports. As was discussed in a previous section of this report, commercial fishermen in District 4 have only a very limited market for summer chum salmon. As a result, fishermen extract and sell roe from their catch and retain the carcasses for subsistence use. During the 1980-1985 period, it is likely that many fishermen have reported this portion of their commercial harvest as subsistence fish. In fact, it is probable that the unmarketable commercial product have simply replaced a large portion of the subsistence harvest in this area. During 1985, Division of Subsistence personnel conducted the subsistence catch surveys in Kaltag and Nulato. Questions regarding summer chum harvest were posed in such a way as to eliminate reporting of "surplus" commercially caught fish as subsistence. For this reason, summer chum catches from these villages during 1985 was much lower than in previous years or the current year. Subsistence surveys and personal interviews from 1986 through 1988 were conducted in such a manner to estimate the number of summer chum salmon taken by commercial related activities and those taken by standard subsistence fishing means.

However, it appears that there is still a problem in differentiating between subsistence and commercial catches. Within District 4, an estimated 95,384 summer chum salmon were taken for subsistence which were unrelated to commercial fishing activities during 1988. In addition, a total of 490,074 summer chum salmon were estimated to have been taken during commercial fishing activities. Only 24,051 of these fish were sold in the round. Subsistence surveys documented the utilization of 106,801 summer chum salmon from the commercial fishing harvest for dog food. There is still a large number of summer chum unaccounted for. It is unknown whether some fish were double counted between subsistence fishing catches and estimates of total commercial related catches.

Subsistence fishing permits are required in three areas within the upper Yukon drainage: (1) the Tanana River drainage upstream of the Wood River confluence; (2) the Yukon River between Hess Creek and Dall River; and (3) the Yukon River between the upstream mouth of Twenty-two Mile Slough and the U.S./Canada border (Table 14 and Appendix Table 32).

Commercial Fishery 1988

Lower Yukon Area

The 1988 Lower Yukon Area (Districts 1, 2 and 3) commercial salmon catch totaled 1,333,509 fish which was comprised of 94,064 chinook, 1,087,335 summer chum, 79,480 fall chum, and 72,630 coho salmon (Appendix Tables 2-5).

Fishing effort, in terms of the actual number of participating fishermen (permit holders), is presented in Appendix Table 8. In 1988 a total of 712 CFEC gill net permits were issued for the Lower Yukon Area (Appendix Table 7). A total of 683 permit holders fished at least once during 1988. Lower Yukon fishermen were paid an average (per pound) of $2.97 for chinook, $0.66 for summer chum, $1.01 for fall chum and $1.38 for coho salmon. The approximate (ex-vessel) value of the harvest was $11,838,000. The average earnings per fisherman was approximately $17,300.

A total of 10 processors operated in the Lower Yukon Area in 1988. Six processors bought fish in more than one district. Nearly all of the commercial salmon catch was shipped to fresh or fresh/frozen markets. One processor in District 1 hard-salted a total of 33 half tierces of chinook, chum, and coho salmon. Canning of salmon in the Yukon Area has not occurred since 1984.

Chinook Salmon

Chinook salmon migratory timing into the lower river appeared to be about average (Appendix Table 38). The Nome mean April air temperature was 23 degrees fahrenheit (6 degrees fahrenheit warmer than the 1961-1987 average). The lower Yukon area was generally free of ice by May 20. The first chinook salmon was reported to have been captured May 27 in Sheldon's Point by a subsistence fisherman. The chinook and summer chum salmon return was primarily through south and middle mouths based on commercial and test net catches. Department test net catches of summer chum salmon increased rapidly while chinook catches remained at low levels until June 2, after which chinook salmon catches increased, indicating a trend of increasing run strength. The increase of chinook and summer chum salmon abundance was further documented by subsistence catch reports.

In response to early summer chum salmon run timing, special restricted mesh size fishing periods were implemented prior to and following the first unrestricted mesh size fishing periods in Districts 1 and 2 (Tables 6 and 7). This allowed an earlier start of the commercial fishing season and an increased harvest of summer chum salmon than would have resulted if the fishery had been delayed until sufficient chinook were present to support an unrestricted mesh size fishery.

The directed fishery for chinook salmon was opened by emergency order after approximately nine days of increasing subsistence and test net catches in the lower Yukon River. The fishery was opened on a staggered basis: June 13 in District 1, June 15 in District 2, and June 19 in District 3. A fishing schedule of two 12-hour periods per week was established.

There were three 12-hour unrestricted mesh size fishing periods each in Districts 1 and 2. This was the least amount of fishing time directed for chinook salmon in the history of the fishery. The cumulative chinook salmon harvest for Districts 1 and 2 following the third unrestricted mesh size period in District 2 was 60,338 fish. This harvest included 7,537 chinook salmon taken during restricted mesh size fishing periods directed at summer chum salmon. Through analysis of comparative test fishing data and sonar enumeration data, the chinook salmon return appeared below average in magnitude at this stage of the run. Mesh size restrictions (six inch or smaller mesh size) were implemented within the established fishing schedules beginning June 23. Seven additional restricted mesh size fishing periods in District 1 (five 12-hour periods, and two 24-hour

periods), and six additional restricted mesh size fishing periods in District 2 (three 12-hour periods, and three 24-hour periods) were allowed. During these restricted mesh size fishing periods, a total of 31,934 chinook salmon were harvested for a cumulative total of 39,469 chinook salmon in restricted mesh size gill nets. By July 6, the lower river test fishery and sonar project indicated the chinook salmon return was about average in magnitude.

The total District 1 and 2 chinook salmon harvest was 92,297 fish, which was 1% above the midpoint of the guideline harvest range, but 24% below the 1983-1987 average harvest. Primary areas of catch included Black River, and the coastal areas of south and middle mouths. In District 2, catches occurred primarily in the upper half of the district.

In District 3, two 12-hour unrestricted mesh size fishing periods and two restricted mesh size fishing periods (one 12-hour period and one 24-hour period) were allowed from June 19-30 (Table 7). Fishing periods were established to occur simultaneously with District 2 to provide fishermen in the lower end of District 3 the convenience of selling fish to District 2 buyers. The initial delay in opening District 3 allowed the first segment of the chinook salmon return to pass through the district prior to the commercial fishery. In response to subsistence fishermen requests, the upper end of District 3 was closed to commercial fishing on June 26 to allow increased subsistence fishing opportunities. A total of 1,767 chinook salmon was commercially harvested in District 3, which was 12% below the midpoint of the guideline harvest range, and 30% below the recent five year average (1983-1987).

Summer Chum Salmon

Summer chum salmon migratory timing into the lower river was early in 1988. There was a very high degree of overlap between the summer chum and chinook salmon returns.

In Districts 1 and 2, restricted mesh size fishing periods were implemented prior to and following the first unrestricted mesh size fishing periods to allow the harvest of summer chum salmon. During these restricted mesh size fishing periods, between June 9 and June 17, 174,197 summer chum salmon were harvested in Districts 1 and 2. A total of 225,049 summer chum salmon were harvested during unrestricted mesh size fishing periods in Districts 1 and 2.

The combined District 1 and 2 summer chum salmon harvest through June 21 was approximately 370,000 fish, well in excess of any other year through this date. However, it was not clear at this point whether the summer chum salmon return was of early run timing and average in magnitude, or of average run timing and above average in magnitude. Therefore, when the twice weekly restricted mesh size fishing schedule was initiated, beginning June 23, fishing periods were maintained at 12 hours duration. This was a reduction of 12 hours in fishing time per period compared to recent years during this portion of the run. Shortly thereafter, it was apparent that the summer chum salmon return was above average in magnitude. Restricted mesh size fishing periods in District 1 and 2 from June 29 through July 7 were increased to 24 hour duration. Beginning July 7 in

District 1 and July 10 in District 2, fishing periods were reduced to 12 hours in duration to increase Andreafsky River summer chum salmon escapements. On July 10, the closed waters area at the mouth of the Andreafsky River was extended for the same reason.

An additional 674,124 summer chum salmon were harvested during the restricted mesh fishing periods, following the unrestricted mesh openings. The commercial fishing season closed July 15 by regulation. The total District 1 and 2 commercial summer chum salmon harvest was 1,073,370 fish, 96% above the 1983-1987 average.

In District 3, there was a 12 and a 24 hour restricted mesh size fishing period following two 12-hour unrestricted mesh size fishing periods. The commercial season closed June 30 as the chinook salmon harvest approached the lower end of the guideline harvest range. Summer chum salmon flesh quality was deteriorating at this time. The closure additionally provided subsistence fishermen an increased opportunity to harvest salmon. The District 3 summer chum salmon harvest was 13,965 fish, approximately 3 times greater than the recent 5-year average (1983-1987).

Fall Chum and Coho Salmon

The 1988 season was expected to be the third consecutive year of anticipated poor fall chum salmon returns. Poor escapements documented in 1982, 1983, and 1984 were expected to produce poor returns in 1986, 1987, and 1988. Considering the Department's difficulty in accurately assessing run strength, and the expectation of a poor return, the commercial fishery in the Alaskan portion of the drainage was managed conservatively.

Fall chum salmon migratory timing into the Lower Yukon Area was early. Commercial catch sampling during the last period of the summer season in District 1 on July 14 and 15 indicated a large proportion of the catch was composed of fall chum salmon. Subsistence and test net catches documented substantial numbers of fall chum salmon entering the river July 23 through July 26. Coho salmon migratory timing into the Lower Yukon Area was about average. Consistent daily test net catches of coho salmon did not begin until August 5, with no significant entry occurring until August 8 and August 12-16.

The cumulative sonar count at Pilot Station through August 2 was 225,000 fall chum salmon. In addition, from July 30 through August 2, fall chum salmon catches near Galena (river mile 530) had been good. Comparable historical data indicated a surplus of fall chum salmon beyond spawning and subsistence harvest requirements was available. The fall season commercial salmon fishery was opened by emergency order on August 8 in District 1 and August 10 in Districts 2 and 3. A fishing schedule of two 12-hour periods per week in the coastal "Set Net Only Area", and of two six-hour periods per week in the remainder of District 1, and in Districts 2 and 3 was established.

The initial fishing periods coincided with the first significant entry of fall chum salmon into the Yukon River since the announcement of the commercial fishing

schedule on August 3. The cumulative harvest was 48,596 fall chum and 11,102 coho salmon after the first fishing period in each district. The fall chum salmon harvest was near the midpoint of the Lower Yukon Area guideline harvest range and similar to the pre-season projected harvest.

In order to distribute the harvest throughout the return, and to maintain adequate fish passage for escapement requirements and for upriver subsistence and commercial fisheries, scheduled fishing periods for August 11 and 15 in District 1, August 14 and 24 in District 2, and August 14 in District 3 were canceled. Harvest rates in subsequent commercial openings were significantly lower than the first commercial fishing period in each district. Additionally, the contribution of coho salmon to the total catch increased in all districts. The commercial fishing season closed by emergency order in Districts 1, 2, and 3 on August 30, August 31, and August 22, respectively. The total Lower Yukon Area harvest was 79,480 fall chum salmon and 72,630 coho salmon. Fall chum and coho salmon harvests in the District 1 "Set Net Only" and "Gill Net Areas" are summarized in Appendix Table 22. The preliminary cumulative sonar count at Pilot Station through termination of the project on September 14 was approximately 507,000 fall chum salmon and 264,000 coho salmon.

Upper Yukon Area

The Upper Yukon Area commercial salmon harvest totaled 7,357 chinook, 64,902 summer chum, 54,495 fall chum and 13,982 coho salmon in 1988. In addition, 259,762 pounds of roe were sold (Table 4). Salmon production data is expressed as number of fish sold in the round, and pounds of unprocessed roe which were sold. Table 13 and Appendix Table 6 present total estimated commercial related chum salmon catch by district during 1988. These catch figures reflect the estimated incidental catch of male summer chum salmon which were not sold and the estimated number of female summer chums harvested during the roe fishery in the Upper Yukon Area. Table 12 presents commercial salmon catch by gear type (set gill net and fish wheel).

A total of 17 buyer/processors and 7 catcher-sellers operated during 1988. Upper Yukon commercial fishermen received an estimated average (per pound, round weight) of $1.04 for chinook, $0.23 for summer chum, $0.32 for fall chum, $0.37 for coho salmon, and $4.33 for salmon roe (Appendix Table 25). The approximate (ex-vessel) value of the 1988 harvest was $1,542,000 which includes an estimated 1.1 million (72%) paid to fishermen for salmon roe sales. During the 1988 season, 170 upper Yukon fishermen participated in the commercial fishery. The average earnings per fisherman was approximately $9,070.

Chinook Salmon

District 4 opened to commercial fishing by emergency order on June 19 on a twice weekly 48-hour fishing schedule (Table 9). A total of 13 fishing periods occurred between June 19 and August 1 when the season closed by regulation. The commercial catch of 3,150 chinook salmon in District 4 was the largest on record. However, this relatively high catch is thought to be more a function of market demand and price rather than a reflection of run strength. In addition, failure of a buyer in this district to submit timely catch reports allowed the harvest

to go several hundred fish higher than would have otherwise been allowed. Based on deliveries, the run peaked during the period which ended on July 8.

All subdistricts of District 5 opened by regulation on June 15. Subdistricts 5-A, 5-B, and 5-C closed by emergency order on July 6; Subdistrict 5-D closed by emergency order on July 14. Commercial fishing in Subdistricts 5-A, 5-B, and 5-C occurred primarily twice weekly during 48-hour periods, while Subdistrict 5-D remained open to commercial fishing seven days per week. A total of 3,436 chinook salmon were harvested by commercial fishermen in District 5 (Table 10). In an attempt to target the midpoint (2,600 fish) of the chinook salmon guideline harvest range for Subdistricts 5-A, 5-B, and 5-C, the last commercial opening was limited to 18 hours rather than the normal 48 hours. During the 48-hour closure prior to the last period, an apparently large group of chinook salmon entered the lower portion of the district. As a result, nearly 1,000 chinook salmon were taken during the last period in these subdistricts and the total catch for this area exceeded the midpoint of the guideline harvest range. In Subdistrict 5-D, which is managed on the basis of a separate guideline harvest range (300-500 chinook salmon), the reported commercial harvest was 461 chinook salmon.

After the spring Alaska Board of Fisheries meeting, and prior to the arrival of salmon in the Tanana River (District 6), Commercial Fisheries Division staff met on two occasions with members of the Interior Fish and Wildlife Association and other Tanana River fishermen to discuss implementation of the newly adopted management plan. After much discussion, it was decided that the opening of the commercial season on the Tanana River would be delayed by approximately two and a half weeks from the date allowed by regulation (June 20). The intent of this plan was to allow the early portion of the chinook salmon run to pass through the district and onto spawning grounds. It was hoped that this strategy would result in chinook salmon escapement objectives in the Chena and Salcha Rivers being met and thereby eliminate the need for mid-season closures. Chinook salmon in the Tanana River commercial fishery are considered to be incidental to the more abundant and (collectively) more valuable summer chum salmon. It was considered less costly, and therefore preferable, to endure closures early in the season before summer chum salmon became abundant. This plan was implemented by emergency order, and staggered openings of the commercial season were scheduled as follows: Subdistrict 6-A on July 1, Subdistrict 6-B on July 4 and Subdistrict 6-C on July 8.

A total of 762 chinook salmon were sold in District 6 (Table 11). In order to prevent the chinook salmon guideline harvest range (600-800 fish) from being taken and having the season closed as a result, most buyers chose not to purchase chinook salmon. During previous years, according to public testimony, chinook salmon sales have been grossly under-reported; however, stepped-up enforcement action by the Division of Fish and Wildlife Protection is thought to have ended this practice. Refusal by the majority of buyers to purchase chinook salmon is thought to have been partially responsible for the higher than average reported subsistence/personal use harvest of chinook salmon on the Tanana River during 1988.

An aerial survey of the Chena and Salcha Rivers on July 20 resulted in escapement estimates of 1,966 and 2,761 chinook salmon, respectively, which were considered acceptable escapement levels. For this reason, it became the position of the

Department that any restrictions which might be imposed on the District 6 commercial or subsistence fishery would not relate to chinook salmon but would be based on conservation requirements of summer chum salmon.

Summer Chum Salmon

As has been the case in recent years, the summer chum salmon fishery in District 4 consisted primarily of salmon roe sales in 1988. A total of 254,526 pounds of summer chum salmon roe was commercially harvested. There were 13 fishing periods, the majority of which were 48 hours in duration. Peak catches of summer chum salmon were made during the fishing period which ended on July 5 which produced approximately 48,000 pounds of salmon roe. Using the average proportion of females captured at the Stink Creek test fishery from 1981-1985 (.579) and an average of 0.897 pounds of roe per female calculated from data collected in 1988, the total estimated commercial related harvest in District 4 was 490,074 summer chum salmon. Only 24,000 summer chum salmon were exported from this district during 1988. Of the remaining chum salmon captured during the fishery, some were sold as dog food, some were retained by fishermen and used for subsistence purposes, but a large number of fish were unaccounted for.

Summer chum salmon are of generally poor quality and are not abundant in District 5. During the 1988 season, approximately 700 summer chums were sold incidentally to the commercial fishery for chinook salmon.

The summer chum salmon fishery in District 6 (Tanana River) occurred coincidental to the chinook salmon fishery. Between July 1 and August 17, fourteen 42-hour fishing periods occurred. The commercial summer chum salmon catch was 40,129 fish, approximately 4% below the 1983-1987 average. As judged by commercial catches of summer chum salmon, it is estimated that the Tanana River run was of average magnitude. Empirical escapement data was not available, but observations by ADF&G staff in the Salcha River suggested large numbers of spawners in that drainage. Accordingly, the commercial season was extended for 2 additional fishing periods beyond the regulatory closing date of August 10.

Fall Chum and Coho Salmon

The summer chum and chinook salmon fishery in District 4 was closed on August 1 in order to evaluate the early portion of the fall run prior to allowing any commercial removal. Based on catches from the test fish wheel near Ruby and on subsistence catches, the run was judged to be early and somewhat stronger than anticipated. Accordingly, the commercial fishing season was reopened on August 7. Seven 48-hour periods were allowed prior to the season closure on August 30. The harvest of 15,662 fall chum salmon and 2 coho salmon was taken by 20 fishermen in Subdistricts 4-B and 4-C.

In subdistricts 5-A, 5-B and 5-C, two 24-hour commercial fishing periods were allowed (August 18-19 and August 20-21). A total of 14,217 fall chum salmon were taken by 18 fishermen. The fall commercial fishery in Subdistrict 5-D was opened on September 9 and closed on September 14. Two fishermen participated in the harvest and took 2,772 fall chum and 8 coho salmon.

The fall chum salmon run in both Districts 4 and 5 showed a distinct bimodal pattern. At the Ruby test fish wheel (mile 604), peaks occurred on August 11 and August 26.

Observations of test fish wheel and subsistence catches indicated that the first fall chum salmon were present in the Tanana River (District 6) in mid-August. Subsequent observations suggested that those first fall chum salmon were relatively few and that the run consisted primarily of summer chum salmon until late August. The first of the three 24-hour commercial fishing periods was begun on September 9. Subsequent openings occurred on September 13 and September 20. Although comparative commercial catch data suggested that the 1988 fall chum salmon run was slightly below average to average magnitude, it was thought that the commercial guideline harvest ranges could be exceeded without jeopardizing subsistence needs or escapement requirements. The rationale behind this decision was that the 1988 level of subsistence fishing effort on the Tanana River was much reduced from previous years. It is thought that the recent loss of markets for subsistence-caught fish and roe was an important factor in this reduction of fishing effort.

The District 6 harvest of 21,844 fall chum salmon was 10% above the 1983-1987 average (Appendix Table 4). The commercial coho salmon catch of 13,972 was a record harvest and was more than twice the 1983-1987 average (Appendix Table 5). It was clear throughout the duration of the fall run that the coho run was unusually strong. Additional commercial harvest of coho salmon could not be allowed because of the possibility of over harvest of fall chum salmon.

Escapement 1988

Comprehensive salmon escapement enumeration studies were conducted in 1988 on the East Fork Andreafsky, Anvik, Chena, Salcha, Chandalar, and Sheenjek Rivers in the Alaskan portion of the drainage and on the Fishing Branch River, Big Salmon River, and at the Whitehorse fishway in Yukon Territory, Canada. Studies at each of these locations were designed to enumerate or estimate the total population of spawners by a variety of methods.

A counting tower was operated on the East Fork Andreafsky River (summer chum and chinook), while hydroacoustic techniques were employed to monitor escapements in the Anvik (summer chum), Sheenjek (fall chum), and Chandalar Rivers (fall chum). Mark-and-recapture methods were used to generate a population estimate for chinook salmon spawners in both the Chena and Salcha Rivers, with the Sport Fish Division conducting the Salcha River study. The Canadian Department of Fisheries and Oceans (DFO) operated a weir on the Fishing Branch (fall chum) and Big Salmon Rivers (chinook), and counted chinook salmon passage through the Whitehorse fishway.

In addition to the aforementioned studies, the Department attempted to enumerate salmon abundance by species in the mainstem Yukon River near Pilot Station (river mile 122) by hydroacoustic methods. At the US/Canada border, DFO generated population estimates for both chinook and fall chum salmon entering Yukon Territory using mark-and-recapture techniques. Remaining escapement information

throughout the Yukon River drainage was obtained primarily by aerial and occasional ground surveys.

Survey conditions in 1988 were generally good to fair throughout the Yukon River drainage during the chinook and summer chum salmon season from mid-July through August. Survey conditions were much improved from the two preceding years for making aerial observations in the Canadian portion of the drainage during this period. Lack of survey aircraft, together with inclement weather conditions, hindered aerial assessment of several fall chum and coho salmon spawning areas from late September through early November.

Escapement estimates obtained in 1988 are shown in Table 16. Figures 2 through 6 show major Yukon River tributary systems.

Chinook Salmon

Appendix Table 33 presents historic chinook salmon escapement data for selected streams during the period 1975-1988. Minimum and optimum chinook salmon escapement goals have been established for eight streams in the Alaskan portion of the drainage: East (1,100-1,600) and West Fork (700-1,000) Andreafsky; Anvik (500); North (500) and south Fork (500) Nulato; Gisasa (650); Chena (1,700); and Salcha (3,500) Rivers (Table 17). These escapement goals are based upon aerial survey counts which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

Based upon aerial surveys, it appears that at least the minimum chinook salmon escapement goal (1,100) was likely achieved in the East Fork Andreafsky River. Although the aerial count was only 1,020 chinook salmon, the survey was flown 4 days prior to the survey target dates (July 20-31). Total escapement to the East Fork Andreafsky River was estimated by tower observations to be 1,339 chinook salmon.

It is probably reasonable to assume that the upper end of escapement goals to the West Fork Andreafsky (1,000) and Anvik (500) Rivers was achieved as 1,448 and 1,637 chinook salmon respectively, were observed in the index areas during aerial surveys flown 4 days prior to survey target dates in these streams (July 20-31). A total of 1,805 chinook salmon was counted in the Anvik River (mainstem plus tributaries).

Chinook salmon escapement objectives were met in both forks of the Nulato River as well as in the Gisasa River.

Chinook salmon escapement to the Tanana River drainage as reflected by the Chena and Salcha Rivers appeared to be good. While the upper end of the Chena River goal was achieved, escapements in the Salcha River fell more near the mid-range goal for that stream. The mark-and-recapture population estimate made for chinook salmon spawners in the Salcha River was 4,562 fish. A population estimate of 3,346 chinook salmon in the Chena River was made using mark-and-recapture data, expanded for the entire river with aerial survey data. An estimated 80,834 chinook salmon migrated past the mainstem Yukon River sonar site at Pilot Station between June 2 and July 18.

The population estimate of chinook salmon entering the Canadian portion of the mainstem Yukon made by DFO was 43,036 in 1988. Subtracting the Canadian commercial and non-commercial harvest of 20,777 fish from this population estimate resulted in a total escapement estimate to Yukon Territory (excluding the Porcupine River drainage) of approximately 22,259 chinook salmon.

Aerial surveys of selected Yukon Territory chinook salmon spawning streams suggested weak escapements to the Teslin River drainage as well as to areas farther upstream, such as through the Whitehorse fishway. Survey counts in index areas of the mainstem Nisutlin and Wolf Rivers, although improved from 1987, were the second lowest observed in the past nine years. A total of 405 chinook salmon returned to the Whitehorse fishway in 1988.

Comparatively, escapements to the Big and Little Salmon Rivers appeared much better, as was the case in 1987. Based upon limited observations made in the Ross and Hoole Rivers, escapements to the Pelly River drainage may also have been comparatively better than those upstream of the Big Salmon River.

Summer Chum Salmon

Appendix Table 34 presents historic summer chum salmon escapement data for selected streams during the period 1975-1988. Minimum and maximum escapement goals have been established for four major summer chum salmon spawning streams in the lower Yukon river drainage: East (76,000-109,000) and West Fork (62,000-116,000) Andreafsky; Anvik (209,000-356,000); and North Fork (37,000-53,000) Nulato River. In addition to the minimum and maximum aerial escapement objectives identified for the Anvik River, an optimum level has been set for estimated total escapement to that stream (487,000). Escapement goals are 5,000-8,000 summer chum salmon for Clear Creek and 5,000-9,000 for Caribou Creek (Hogatza River drainage).

Summer chum salmon escapements to the Andreafsky and Nulato Rivers in 1988 were well below the minimum escapement goals established for each of these streams based upon aerial surveys flown 4 days prior to the survey target dates (July 20-31). Based upon the sonar-estimated escapement of summer chum salmon in the Anvik River, the optimum level of spawners was exceeded by more than double in 1988.

Summer chum salmon escapement to the Tanana River appeared slightly below average based upon observations made in the Salcha River, the only stream in this drainage where an escapement goal has been established (3,500). A total of 2,889 chum salmon was observed on a peak survey of this stream on August 1. However, the survey was made under poor conditions.

Fall Chum Salmon

Appendix Table 35 presents historic fall chum salmon escapement data for selected streams since 1975. Escapement objectives have been established for three major fall chum salmon spawning streams in the Alaskan portion of the drainage: Sheenjek (62,000), Toklat (33,000), and Delta (11,000) Rivers. These are total

abundance escapement goals for each of these streams based upon expansion of in-season point estimates.

Overall, fall chum salmon escapements were generally poor in 1988, and below objective levels throughout the drainage. Only streams in the upper Tanana River (upstream of Kantishna River) appeared to meet escapement objectives.

Escapements to the Porcupine River drainage were evaluated by performance of the Sheenjek and Fishing Branch Rivers. A preliminary sonar count of approximately 38,800 chum salmon was obtained in the Sheenjek River this season. However, this count does not include 5-6 partial days of down-time throughout the counting period due to high water problems. This level of escapement is the third lowest sonar estimate on record for the Sheenjek River and falls well below the escapement objective of 62,000 fish. Annual escapement estimates since 1981 have ranged from a low of 27,130 (1984) to a high of 152,768 (1985).

An interim fall chum salmon escapement objective range was established for the Fishing Branch River in October 1987 by the joint Canada/United States Yukon River Technical Committee. The lower end of the range was 50,000 and the upper end 120,000 fish. The 1988 preliminary weir count for the Fishing Branch River (23,597) falls well below the lower end of the escapement objective range.

Comprehensive escapement enumeration of fall chum salmon in the Chandalar River was undertaken for the third year, in 1988, by the USFWS. The preliminary sonar-estimated escapement was 33,619 fish. This is approximately 19,000 and 26,000 fish less than was estimated in 1987 and 1986, respectively.

In the Tanana River drainage, fall chum salmon escapement to the Toklat River remained low. Total abundance of spawners was estimated at 13,324, which was below the escapement goal of 33,000 fish for that stream. Only in the upper Tanana River drainage, upstream of the Kantishna River, did fall chum salmon escapements appear comparatively stronger. The Delta River spawning population was estimated at 18,024 fish, which was the only index area to exceed escapement objectives. Peak estimates of spawners at four other aerial index spawning areas in the vicinity of Big Delta, for which no escapement goals have been established, were the highest observed since 1983.

A radio telemetry study was conducted during 1988 to determine the location of major fall chum salmon spawning areas in the upper Tanana River (upstream of Fairbanks). Although no previously unknown spawning areas were documented, results suggest that the numerous and relatively small spawning areas in the mainstem river, when taken collectively, represent a more substantial contribution to Tanana river fall chum salmon spawning stocks than previously realized.

The population estimate of fall chum salmon entering the Canadian portion of the mainstem Yukon River made by DFO was 69,153 fish in 1988. Subtracting the combined Canadian commercial and non-commercial harvest of 33,565 fish resulted in a total escapement estimate of approximately 35,588 fish. The aerial estimate of spawners in the Kluane River was 6,950. Approximately 1,550 fall chum spawners were estimated in the mainstem Yukon River spawning areas between Fort

Selkirk and Tatchum Creek. These estimates are 5,050 and 4,565 fish less than those made to these areas, respectively, in 1987.

Coho Salmon

Escapements of coho salmon to index areas examined in the Tanana River in 1988 were significantly lower than recent years in the Nenana River index areas; higher than most other years of observations in the Delta Clearwater River; and lower than recent year's observations in Clearwater Lake and outlet (Appendix Table 36).

Enforcement 1988

The primary enforcement authority for violation of Fish and Game regulations is the Division of Fish and Wildlife Protection within the Department of Public Safety. For purposes of enforcing commercial and subsistence fishing regulations within the Yukon River drainage, the Division of Fish and Wildlife Protection has employees permanently stationed in McGrath, Aniak, Galena, Coldfoot, and Fairbanks. During the fishing season, officers are stationed in a temporary camp near the Dalton Highway bridge and at other locations along the Yukon and Tanana Rivers.

Lower Yukon Area

Fish and Wildlife Protection officers based out of the McGrath and Aniak offices conducted periodic aerial patrols of the Lower Yukon Area during June and July. A total of 20 citations was issued for violation of buyer reporting requirements, violation of license or picture identification requirements, and violation of closed waters. Fish and Wildlife Protection did not conduct patrols during the August commercial fishery.

Upper Yukon Area

During the 1988 season, a total of 14 citations was issued by protection personnel dispatched out of the Fairbanks office and 16 citations were issued by personnel based out of the Galena office. Citations were issued primarily for fishing during closed periods, failure to provide timely catch reports, and failure to properly mark commercial fishing gear.

Enforcement 1987

In August of 1987, Division of Fish and Wildlife Protection officers initiated an investigation of illegal sales of salmon and salmon roe in the Upper Yukon Area. In February of 1988, 268 criminal charges against 17 fishermen were filed for review and prosecution by the office of the Attorney General in Fairbanks. In addition, the staff of the Attorney General has civil cases pending against two processors allegedly involved in the illegal purchase, processing, and sale of salmon and salmon roe from the subsistence fishery in portions of Districts 4, 5, and 6. As of this writing criminal prosecutions have not been undertaken, nor have the civil cases been fully adjudicated.

Records seized from processors (primarily in the form of shipping documents) provided an opportunity to estimate more closely the actual number of fish harvested during 1987. Evidence seized during the investigation revealed that approximately 251,000 pounds of processed fall chum salmon from Districts 5 and 6 combined were sold illegally. This poundage can be expanded by a factor of 1.28 to account for processing weight loss (heads and entrails) and then divided by 7.6 pounds (1982-1986 mean round weight of fall chum salmon in the Upper Yukon commercial fishery) to derive the approximate number of fish involved. This calculation resulted in an estimate of 4,042 fall chum salmon caught and illegally sold in District 5 (from 24,000 pounds of processed fish), and an estimated 38,232 fall chum salmon from District 6 (Table 18).

In addition to salmon roe from fall chum and coho salmon, the Division of Fish and Wildlife Protection has reported illegal sales (in 1987) of 653 and 2,136 chinook salmon from Districts 5 and 6, respectively.

The amount of processed roe determined by the Division of Fish and Wildlife Protection to have been purchased and sold illegally was expanded by a factor of 1.2 to compensate for egg breakage, dehydration and loss which occurs during processing. Species composition of the unreported catch in the Yukon River (the upper portion of District 4 and the lower 160 miles of District 5) was estimated by applying the same percentage of fall chum and coho salmon to the illegally sold roe as was reported in subsistence fisheries in the same area. The extrapolation method used for determining species composition in District 6 was based on records seized from one processor which indicated that 74% and 24% of illegally sold roe was from fall chum and coho salmon, respectively. In order to estimate the number of fall chums harvested for roe an average roe weight of 1.0 pound per female fall chum salmon and 0.8 pounds per female coho salmon was assumed. A sex ratio of 1:1 for both species was used.

A total of 110,948 pounds of processed roe (fall chum and coho combined) from the subsistence fishery was determined to have been sold from the three Upper Yukon districts in 1987. By applying the expansion factor of 1.2:1 it is estimated that this amount of finished product derived from approximately 133,138 pounds of raw product. Available evidence indicates that approximately 52,620 pounds of unprocessed eggs from Yukon River Districts 4 and 5 and approximately 80,518 pounds of unprocessed eggs were purchased from subsistence fishermen on the Tanana River. Using the species composition of the reported subsistence harvest in District 5, the aforementioned roe weight per female, and the assumed 1:1 sex ratio of the catch, it is estimated that a minimum of 95,768 fall chum salmon and 11,840 coho salmon were harvested in the vicinity of Tanana, Rampart and the Dalton Highway bridge. The reported subsistence harvest from this area was only 67,931 fall chum and 6,825 coho salmon.

In District 6, it is thought that of the estimated 80,518 pounds of unprocessed roe sold, 59,584 pounds were from fall chum salmon and 20,934 was coho salmon roe. Using the same roe weight and sex ratio assumptions as were used in the District 5 calculations, it is estimated that a minimum of 119,168 fall chum salmon and 52,335 coho salmon were harvested at Manley and Nenana during 1987. The reported subsistence harvest for those communities was 31,176 fall chum salmon and 21,059 coho salmon.

Substituting the estimated "equivalent catches" derived from roe sales data for the reported subsistence catches in communities where illegal roe sales occurred, increases the estimated harvest in District 5 by roughly 27,800 fall chum salmon and by approximately 5,000 coho salmon. This exercise raises the estimated District 5 subsistence catch estimates to 151,625 fall chum salmon and 11,840 coho.

In District 6, the revised estimate of total harvest is 127,903 fall chum and 55,471 coho salmon. This compares to totals of 39,911 and 24,195 coho salmon previously estimated for this district.

It should be understood that although these are the best estimates which can be produced using available information, the method of substituting estimated equivalent catch for the reported subsistence harvest produces minimum estimates. These estimates are low because roe was not sold from all salmon caught in areas where illegal roe sales occurred. Further, it is not reasonable to add the reported subsistence harvest to the estimated equivalent catch since it is probable that some portion of the catch from which eggs were sold had been previously reported.

OUTLOOK FOR 1989

Chinook Salmon

The majority of the chinook salmon returning to the Yukon River are 6-year old fish, however, 5 and 7-year old fish make a significant contribution to the run. Spawning area escapements during the 1983 brood year (age 6 in 1989) were judged to be below average to above average in magnitude as indicated by comparative escapement information. Survival and production of the 1983 brood year is apparently average based on preliminary findings of a normal contribution of 5-year old fish to the 1988 commercial catch. It is expected that the 1989 return of 5-year-olds (1984 brood year) will be above average based on near average escapements during 1984, and the above average number of 4-year old fish in the 1988 commercial catch. The return of 7-year old fish (1982 year class) is expected to be below average, as the return of this year class in 1987 as 5-year-olds, and in 1988 as 6-year-olds was below average. Overall, the 1989 chinook salmon return is anticipated to be average in strength. The commercial harvest in Alaska (Districts 1-6) is expected to total 90,000 to 110,000 chinook salmon (85,000-103,000 fish in the lower Yukon area, 5,000-7,000 fish in the upper Yukon area).

Summer Chum Salmon

Summer chum salmon return primarily as 4-year old fish, although substantial 5-year old returns often result from brood years with high survival rates. The return of 4-year old fish in 1989 will be dependent on production from the 1985 brood year and survival of the resulting cohort. Based on available catch and escapement data, the magnitude of the 1985 summer chum salmon run was judged

above average in abundance. The return of 5-year old fish in 1989 is expected to be above average in strength based on the above average return of 4-year old fish in 1988. The Anvik River summer chum salmon stock is expected to be the primary contributor to the 1989 return. In summary, based on evaluation of brood year run size data and assuming average survival, it is expected that the Yukon River summer chum salmon return in 1989 will be above average in magnitude. The commercial harvest is expected to be similar to the 1988 harvest (900,000-1,000,000 fish and 250,000 pounds of roe).

Fall Chum Salmon

Similar to summer chum salmon, fall chum salmon return primarily as 4-year old fish. Parent year escapements in 1985 were below average to above average in magnitude. The contribution of age 3 fish in the 1988 return was average based on preliminary data, suggesting an average return of 4-year old fish in 1989. The return of 5-year fish (1984 brood year) is expected to be below average based on the contribution of 4-year-olds to 1988 catches and below average escapements in 1984. In summary, based on evaluation of brood year escapements and assuming average survival, an average return of fall chum salmon is expected in 1989. A commercial harvest between 145,500 and 320,500 fish is anticipated (120,000-220,000 fall chum salmon in the Lower Yukon Area and, 25,500-100,500 fall chum and coho salmon combined in the Upper Yukon Area).

Coho Salmon

Coho salmon return primarily as 4-year old fish. Comprehensive escapement information for coho salmon is lacking, but escapement surveys in the Tanana River system indicated average run strength in 1985. The commercial harvest is expected to be 50,000-90,000 fish and will be dependent on the timing and frequency of fishing periods allowed for fall chum salmon.

CAPE ROMANZOF DISTRICT HERRING FISHERY

Commercial Fishery 1988

Commercial Pacific herring fishing periods were established by emergency order during May 24-26 for a total fishing time of 11 hours (Table 19). A total harvest of 1,119 short tons (st) was made by 113 fishermen. The entire harvest was taken from Kokechik Bay (Figure 21).

Over 99% of the harvest was taken as sac roe. Average roe recovery wa 9.1%. Wastage of Pacific herring was not a problem during the 1988 season.

Estimated value of the total harvest to fishermen was $1.02 million. The average price for sac roe Pacific herring was $1,000 per st at 10% roe recovery, plus or minus $100 a percentage point. The majority of the bait quality herring was purchased according to the sac roe price schedule. Six processors purchased herring in the Cape Romanzof District, three less than during 1987 (Appendix Table 40). A total of 113 fishermen participated in the fishery, the second

highest effort on record but 28% below the 1987 effort level. Local fishermen (residents of Chevak, Scammon Bay and Hooper Bay) accounted for 63% of the effort and 60% of the catch.

The overall exploitation rate of Pacific herring was estimated to be 17% of the available biomass. Age composition information indicated age 8 and older Pacific herring comprised approximately 71% of the total harvest. Age 5 herring comprised approximately 2% of the harvest; age 4 herring were not present in the catch.

Seven Fish and Wildlife Protection (FWP) officers were present on the Cape Romanzof fishing grounds during the 1987 Pacific herring commercial fishing season. These officers were supported by the Protection Vessel (P/V) WOLSTAD, 2 skiffs, a helicopter, and two fixed wing aircraft including a Grumman Goose and a Cessna 185. A total of 19 commercial fishing citations were issued: fishing during closed periods (9); over limit on gear (4); license violations (3); lack of photo identification (2); and lack of vessel registration (2). Additionally, FWP seized 14.7 st of herring, six units of gear, and one vessel.

Implementation of two new regulations adopted by the Alaska Board of Fisheries in December 1987, a moratorium on new fishing effort, and participation by FWP provided for an orderly fishery. In effect for the first time during the 1988 season was a regulation which prohibited the use of mechanical shakers, and a regulation which was made effective by emergency order that restricted gill net gear to a maximum of 50 fathoms per vessel.

In coordination with the Department, a "beach party" was held where fishermen provided catch samples for evaluation by the industry representatives. Roe recovery information indicated that over 96% of the Pacific herring sampled were mature. Roe recovery of fish captured in 3 inch mesh size gill nets was in excess of 10%, while roe recovery from fish captured in 2 3/4 inch mesh size gill nets ranged from 5.2% - 10%. Low roe recovery samples were the result of catches with high male ratios obtained primarily in offshore sets. Following evaluation of roe quality, the fleet was given 2 hours notice prior to the beginning of the second and final commercial fishing period. Participation of fishermen in collecting samples, processor evaluation of samples, and flexibility of fishermen to fish on short notice resulted in obtaining an optimum roe recovery.

Subsistence Fishery 1988

A preliminary subsistence harvest estimate of 6.9 st of Pacific herring was reported to have been taken by 35 fishing families from Hooper Bay, Chevak, and Scammon Bay (Appendix Table 41). The subsistence harvest survey was conducted though the mail by catch questionnaire. Just 16% of the questionnaires were returned. Approximately 54% of the fishermen that returned questionnaires reported more herring were present during 1988 than during other recent years. Only 6% of the fishermen reported less herring than during previous years, while the remainder of the fishermen made no report regarding herring abundance. The catch figures represent only the harvest which was reported. Therefore, the reported catch is a minimum estimated since not all families were mailed questionnaires and not all families which received questionnaires returned them.

Herring Abundance

Aerial surveys were flown during the 1988 season on May 23 and 25. During both surveys, turbid waters prevailed within Kokechik and Scammon Bays. The May 25 survey was conducted utilizing the FWP helicopter during which approximately 500 st of Pacific herring were observed under unsatisfactory survey conditions.

Test fishing was conducted from May 20 to June 5. A total of 609 samples were collected from these catches. Pacific herring comprised approximately 98% of the total catch of schooling species. The commercial harvest was sampled May 24-26. A total of 418 Pacific herring was sampled from the commercial harvest.

It was not possible to achieve a Pacific herring spawning biomass estimate based on aerial surveys due to turbid water conditions during 1988. Evaluation of spawn deposition surveys, test fishing, and age composition data from test and commercial catches resulted in a Pacific herring biomass estimate of 6,600 st. Based on age composition information approximately 61% of the total biomass was composed of age 8 and older Pacific herring. Age 5, 6, and 7 Pacific herring accounted for 6%, 11%, and 19% (percent by number) of the biomass, respectively. Newly recruited age 3 and 4 Pacific herring represented less than 1% and 2% of the total observed spawning biomass, respectively.

Ground surveys indicated spawn deposition occurred from May 19 until at least termination of the project, with the majority of spawn deposited from May 21-28. A series of holdover tides from May 24 to May 28 made spawn deposition evaluation difficult. Spawn deposition occurred over an extended duration and generally exceeded an average of 2 egg layers in primary spawning areas. Samples for quantitative spawn deposition studies were collected. Results from this study are pending program review by the statewide herring biometrician.

Outlook 1989

Emergency order authority will be used to adjust the occurrence and length of fishing periods. It is very likely that gear will be restricted to 50 fathoms per vessel. A minimum level of biomass cannot be used to determine the timing and duration of commercial fishing periods since turbid water conditions usually preclude aerial biomass assessments. Therefore, test and commercial catch rates and spawn deposition observations will be used to determine timing and duration of commercial fishing periods. Average harvest for the period 1980-1988 was 1,068 st. Projected return for 1988, based upon limited information is 3,990 st which at a 20% exploitation rate would result in a harvest of approximately 800 st.

COMMERCIAL FRESHWATER FISHERIES

Regulations adopted by the Alaska Board of Fisheries allow the Department of Fish and Game to issue permits for the commercial harvest of miscellaneous species of fish such as whitefish, sheefish, char, trout pike, blackfish and lamprey. Permit authorization is not required for the sale of these species when taken incidentally in during commercial salmon fishing.

Commercial fisheries for species other than salmon have been allowed in widely scattered locations throughout the Yukon and Tanana River drainage and in the Colville River on the North Slope; most of these fisheries are limited, experimental operations, and occur only sporadically.

A commercial fishery for whitefish has existed in the Colville River delta (located approximately 60 miles west of Prudhoe Bay) since 1964. Fishing generally takes place during late June and July for broad and humpback whitefish, and October through early December for arctic and least cisco. Set gill nets (of 3 and 5 inch mesh) are used as capture gear, and fishing during fall months occurs under the ice (Appendix Table 42).

In the Upper Yukon Area, set net fisheries targeting on whitefish have been permitted in recent years in Lake Minchumina and Healy Lake. Catch data are presented in Appendix Table 43.

Numerous other permits allowing limited harvests of whitefish, primarily for the Upper Yukon Area, have been issued. In most cases, commercial harvests have not occurred.

Permits for the taking of non-salmon species have been issued for various locations in the Lower Yukon Area. Reported harvests for those fisheries are presented in Appendix Table 44. Set gill nets are primarily used for taking whitefish and sheefish and the catch is marketed in local village stores or Bethel.

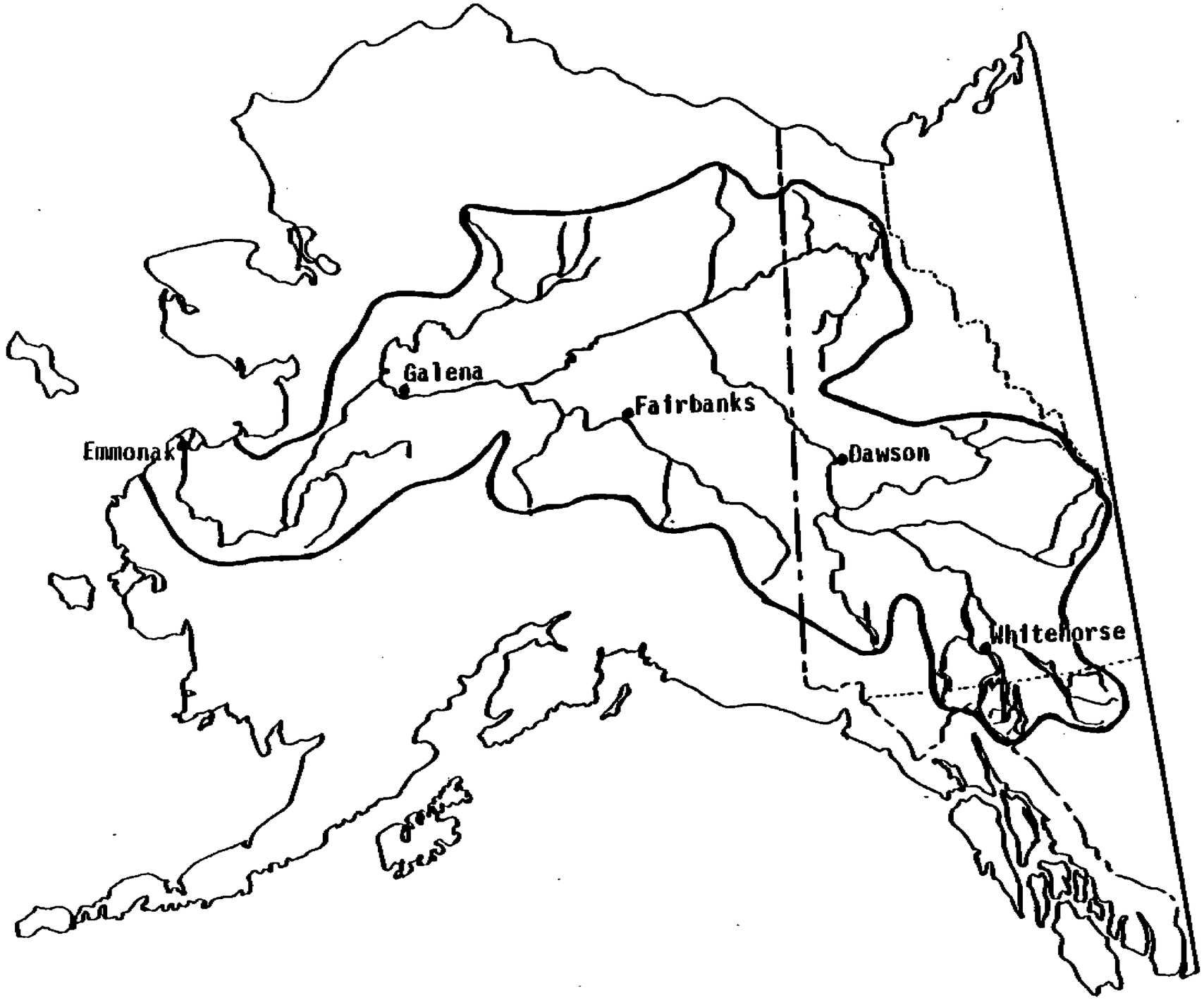


Figure 1. The Yukon River drainage, 330,000 square miles.

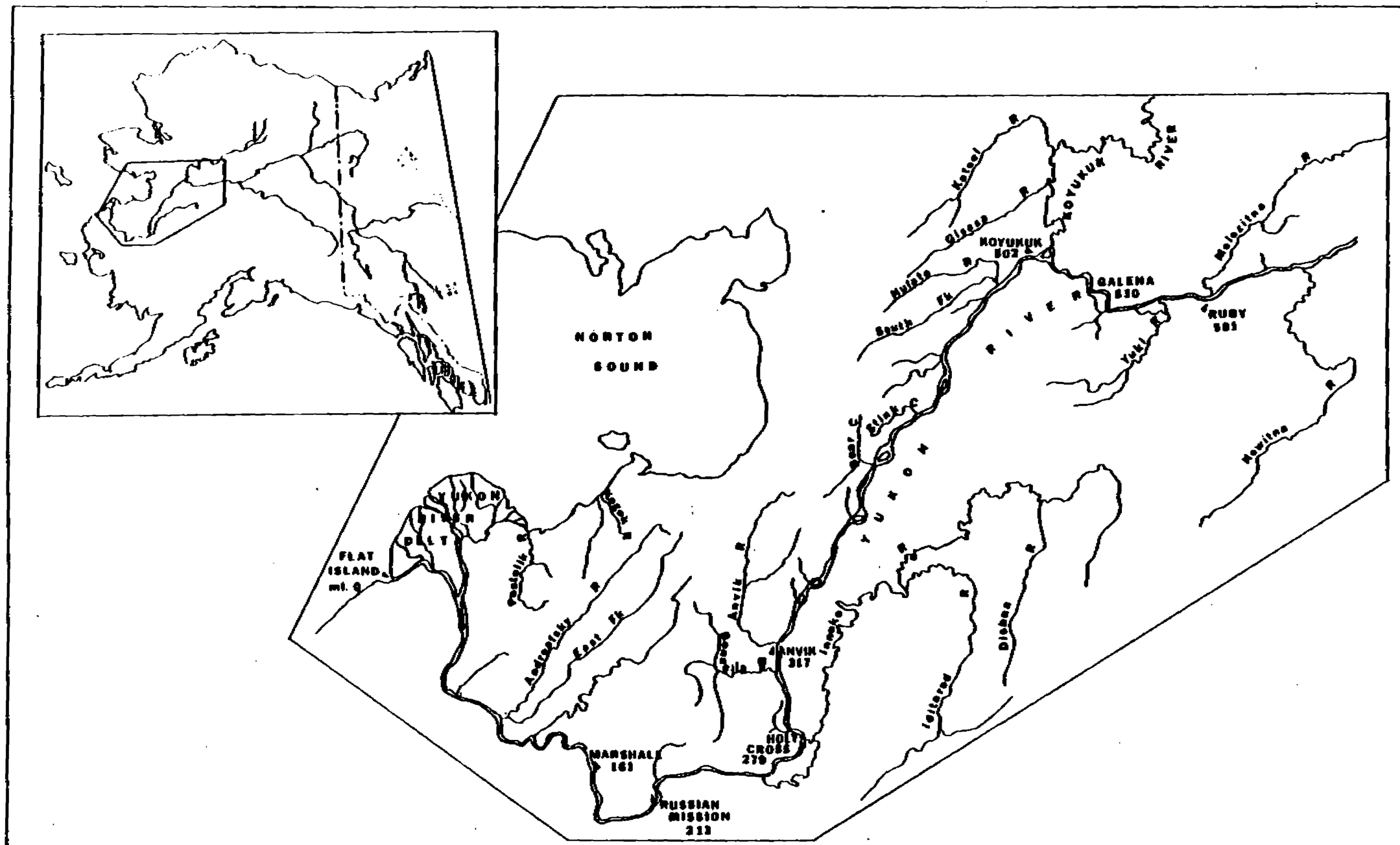


Figure 2. The lower Yukon River drainage.

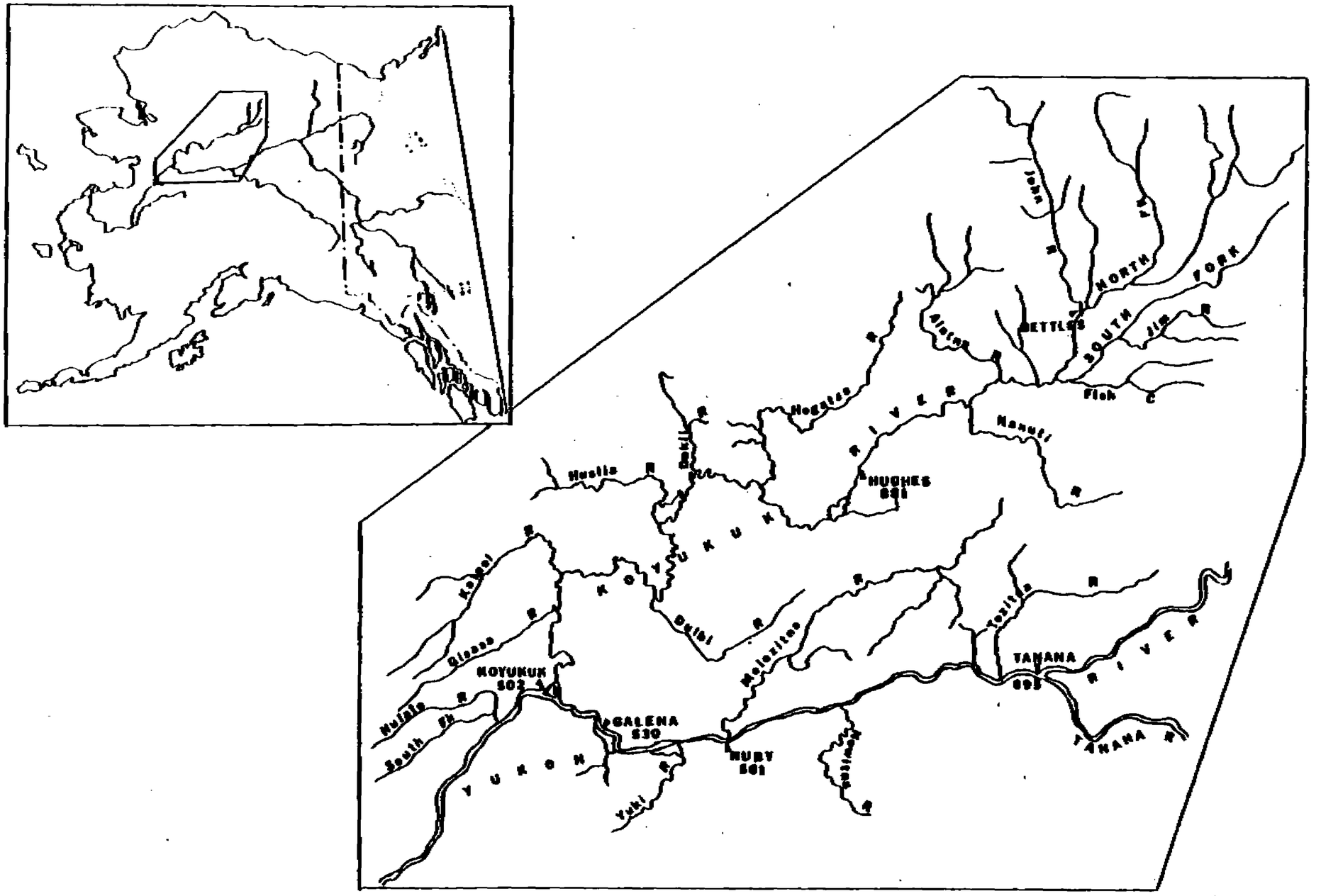


Figure 3. The Koyukuk River drainage.

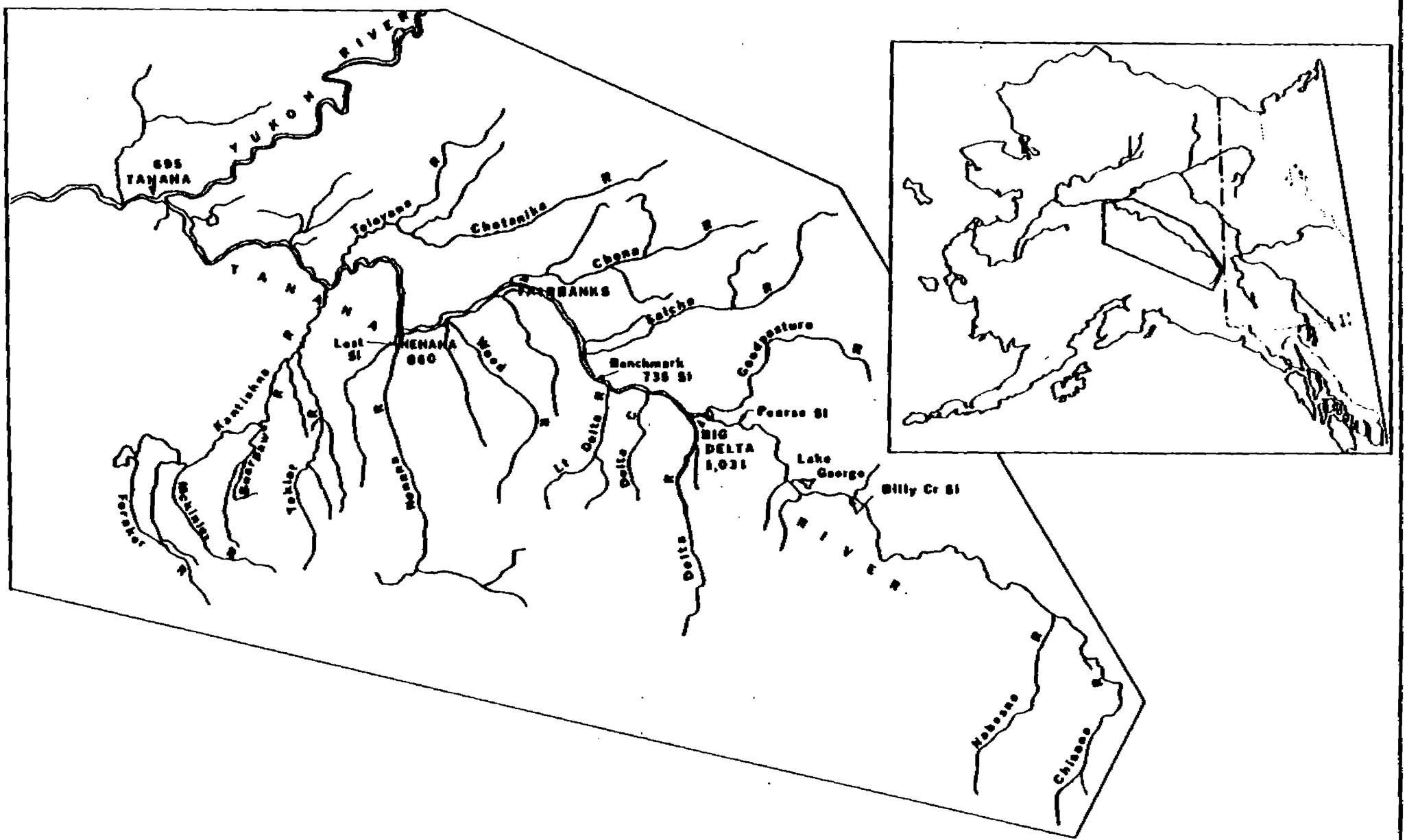


Figure 4. The Tanana River drainage.

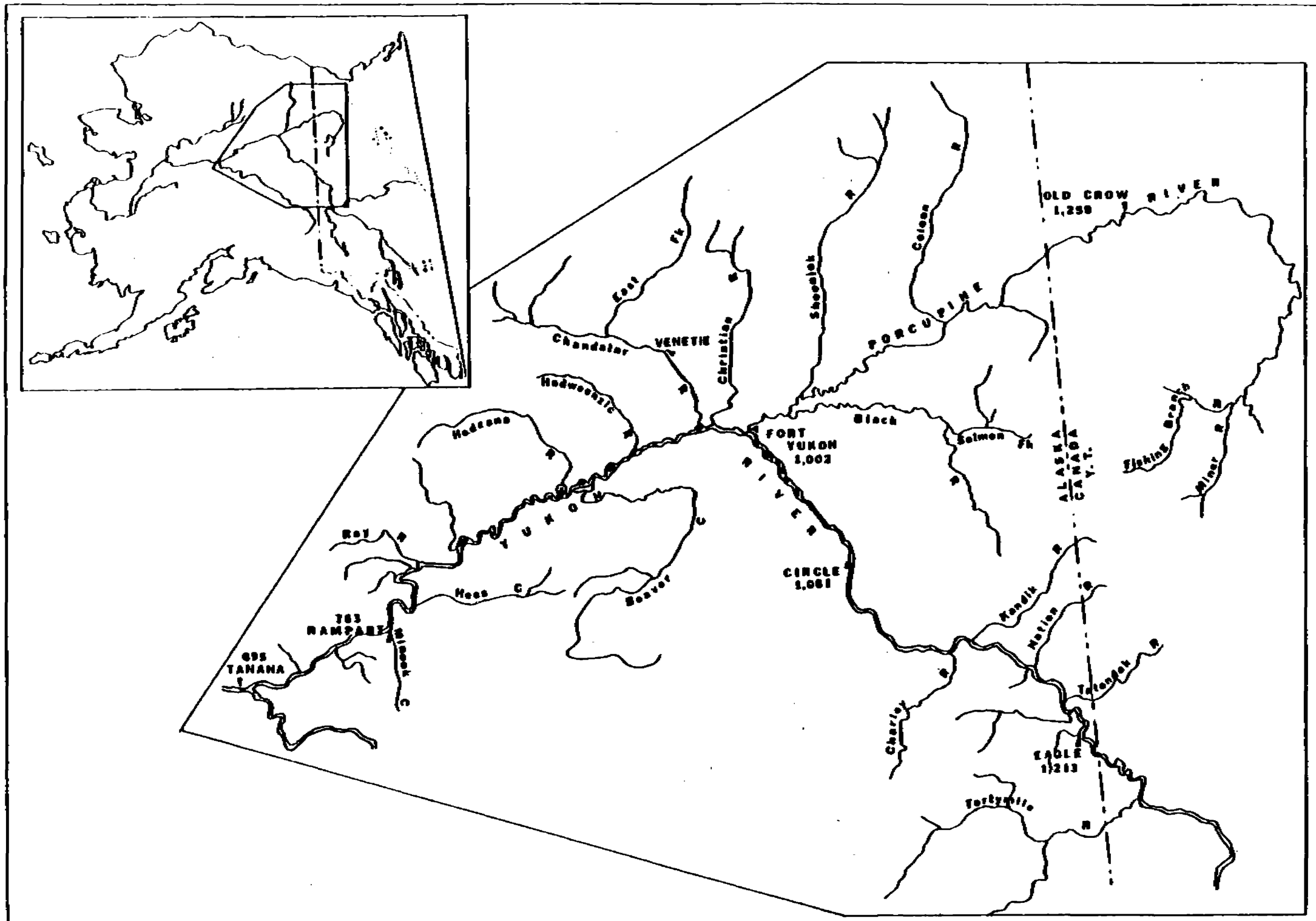


Figure 5. The middle Yukon River and Porcupine River drainage.

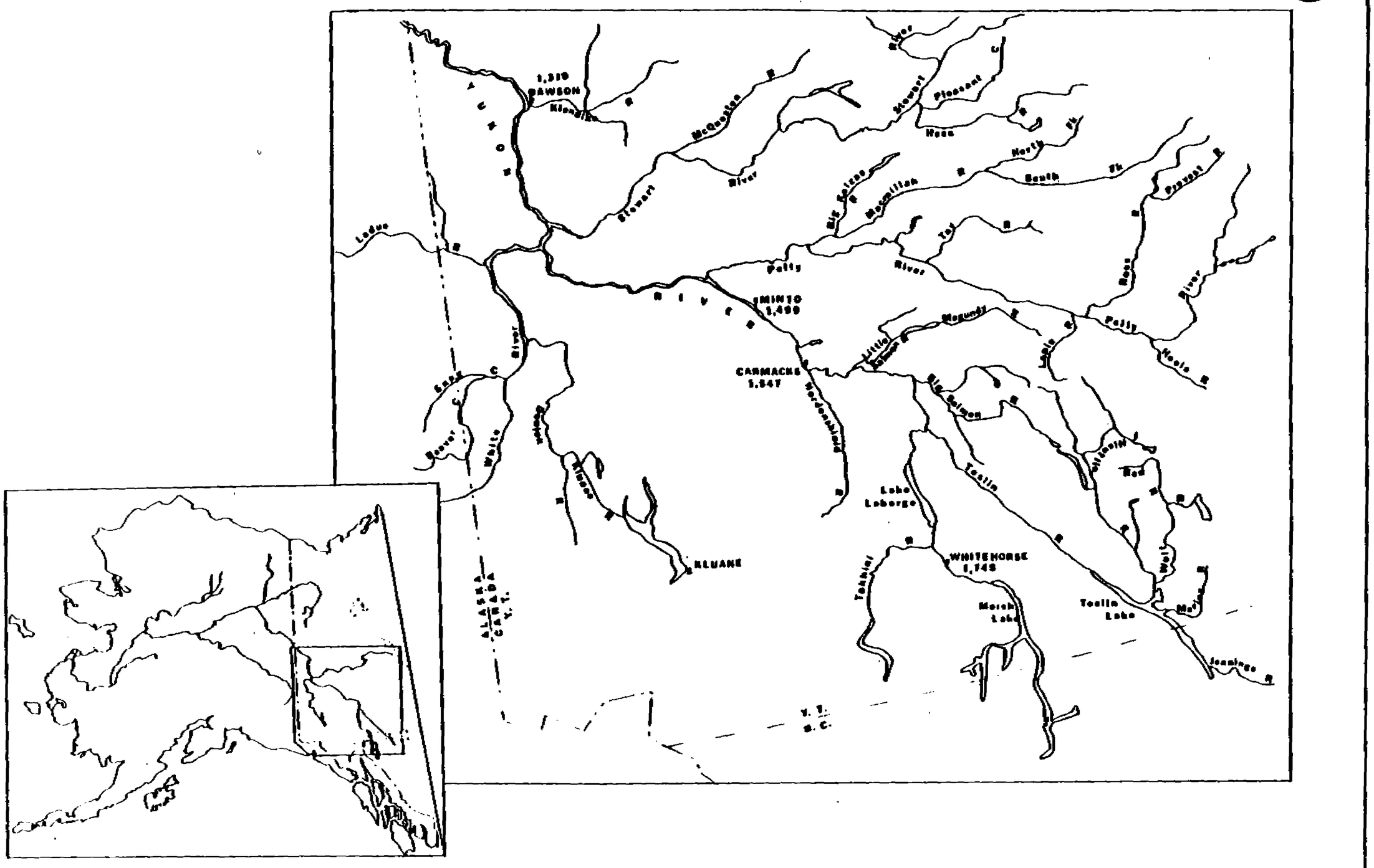


Figure 6. The upper Yukon River drainage.

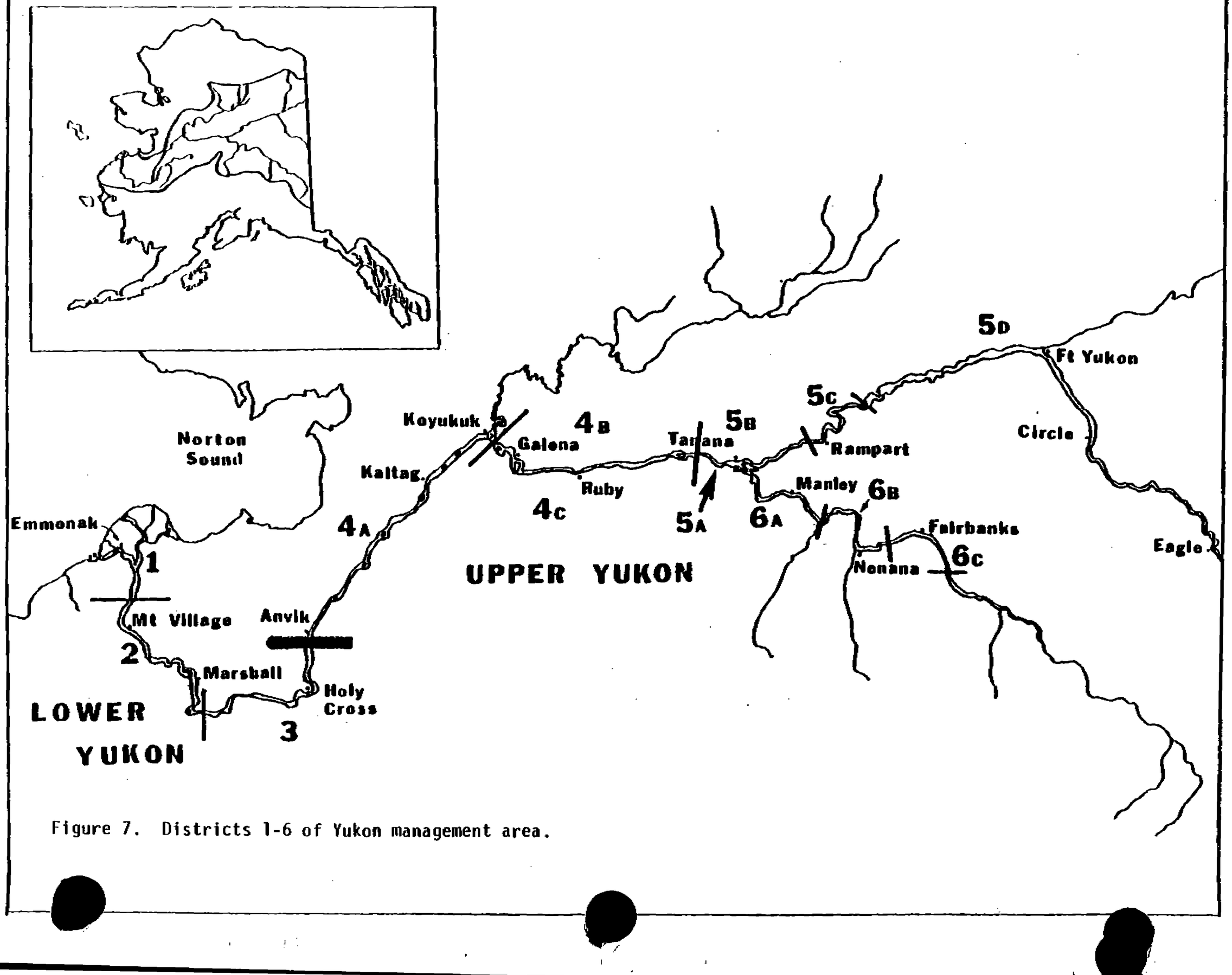
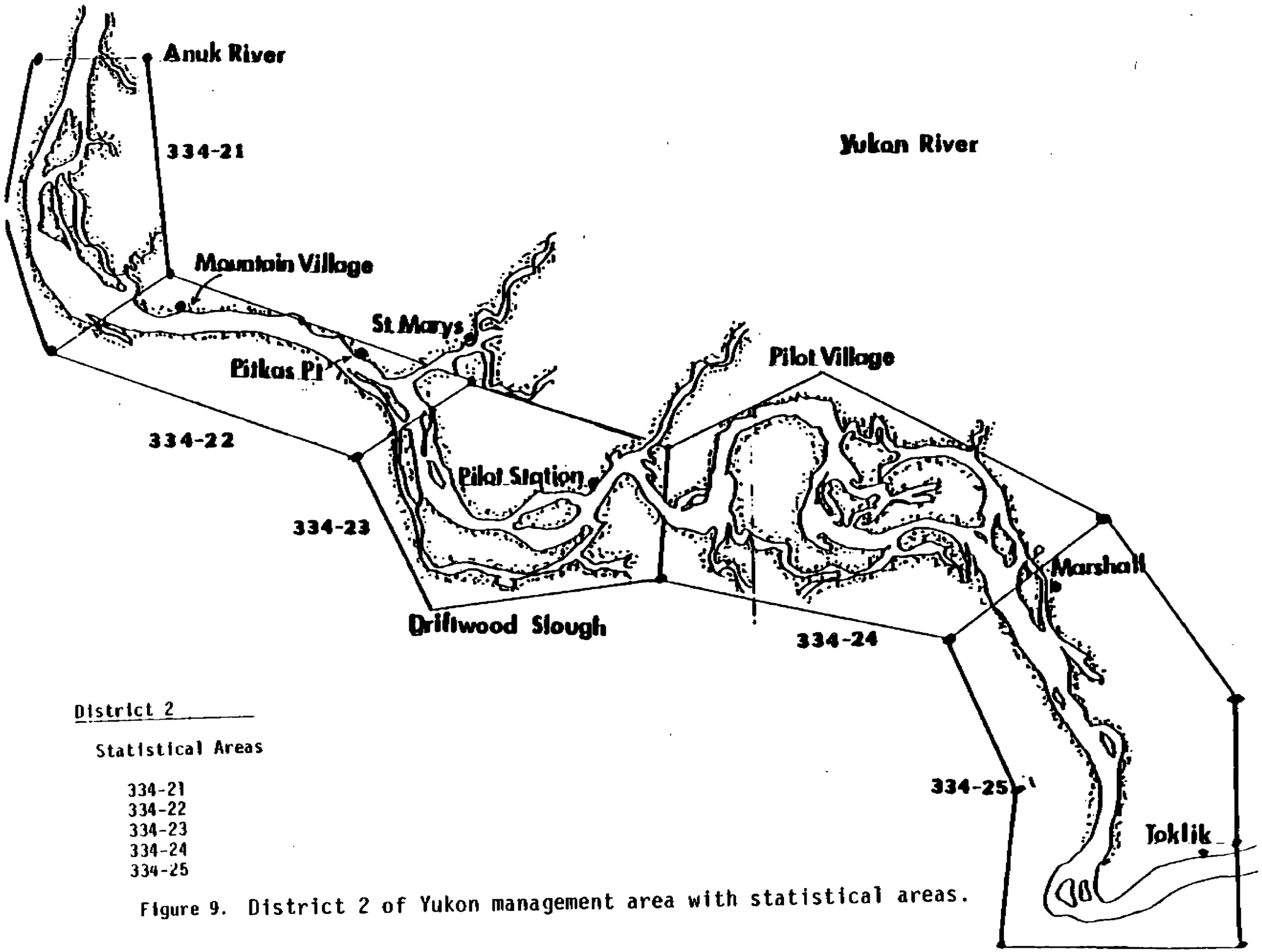


Figure 7. Districts 1-6 of Yukon management area.



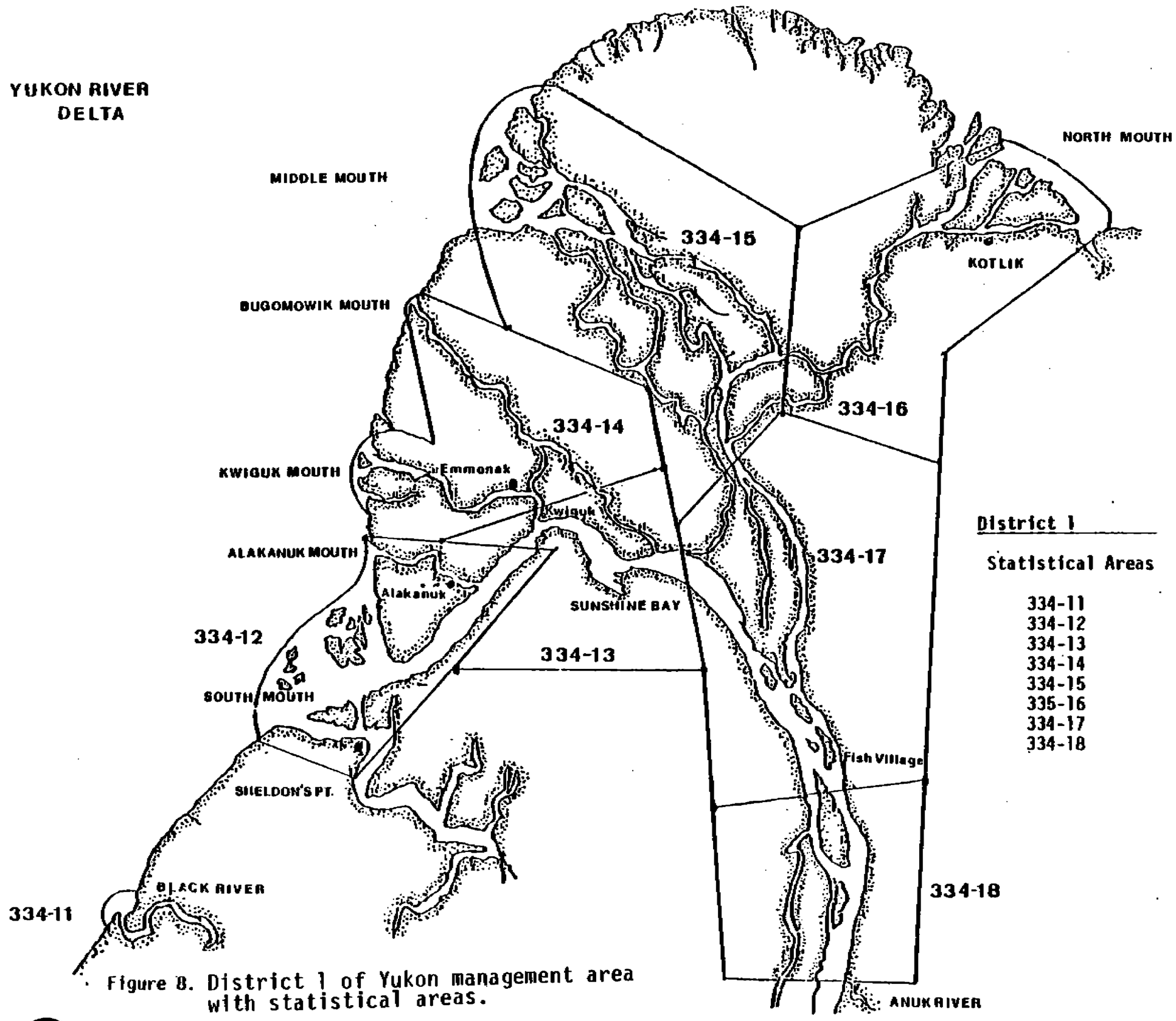
District 2

Statistical Areas

334-21
334-22
334-23
334-24
334-25

Figure 9. District 2 of Yukon management area with statistical areas.

YUKON RIVER DELTA

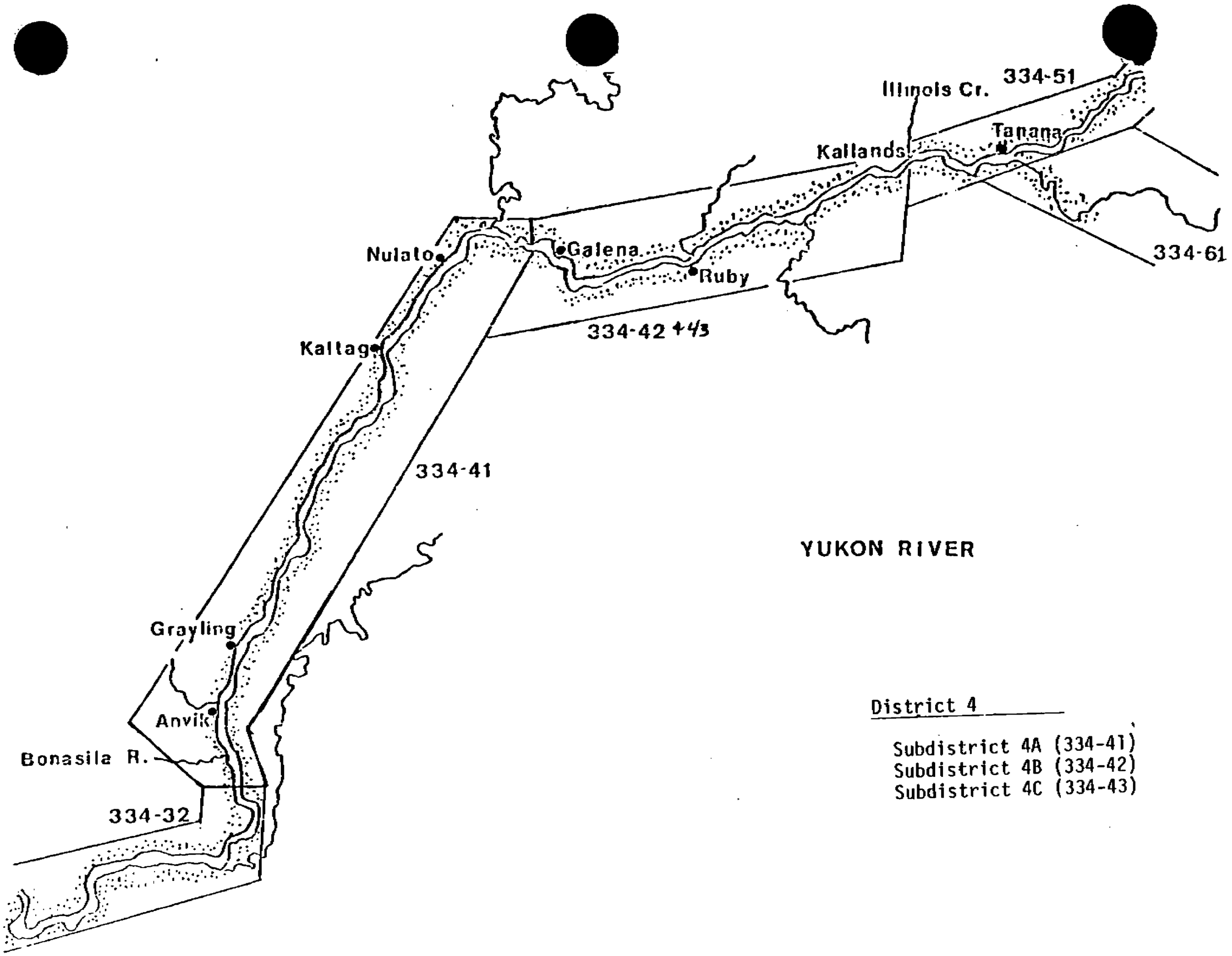


District 1

Statistical Areas

334-11
334-12
334-13
334-14
334-15
335-16
334-17
334-18

Figure 8. District 1 of Yukon management area with statistical areas.



District 4

Subdistrict 4A (334-41)
Subdistrict 4B (334-42)
Subdistrict 4C (334-43)

Figure 11. District 4 of Yukon management area with statistical areas.

District 3

Statistical Areas

334-31
334-32

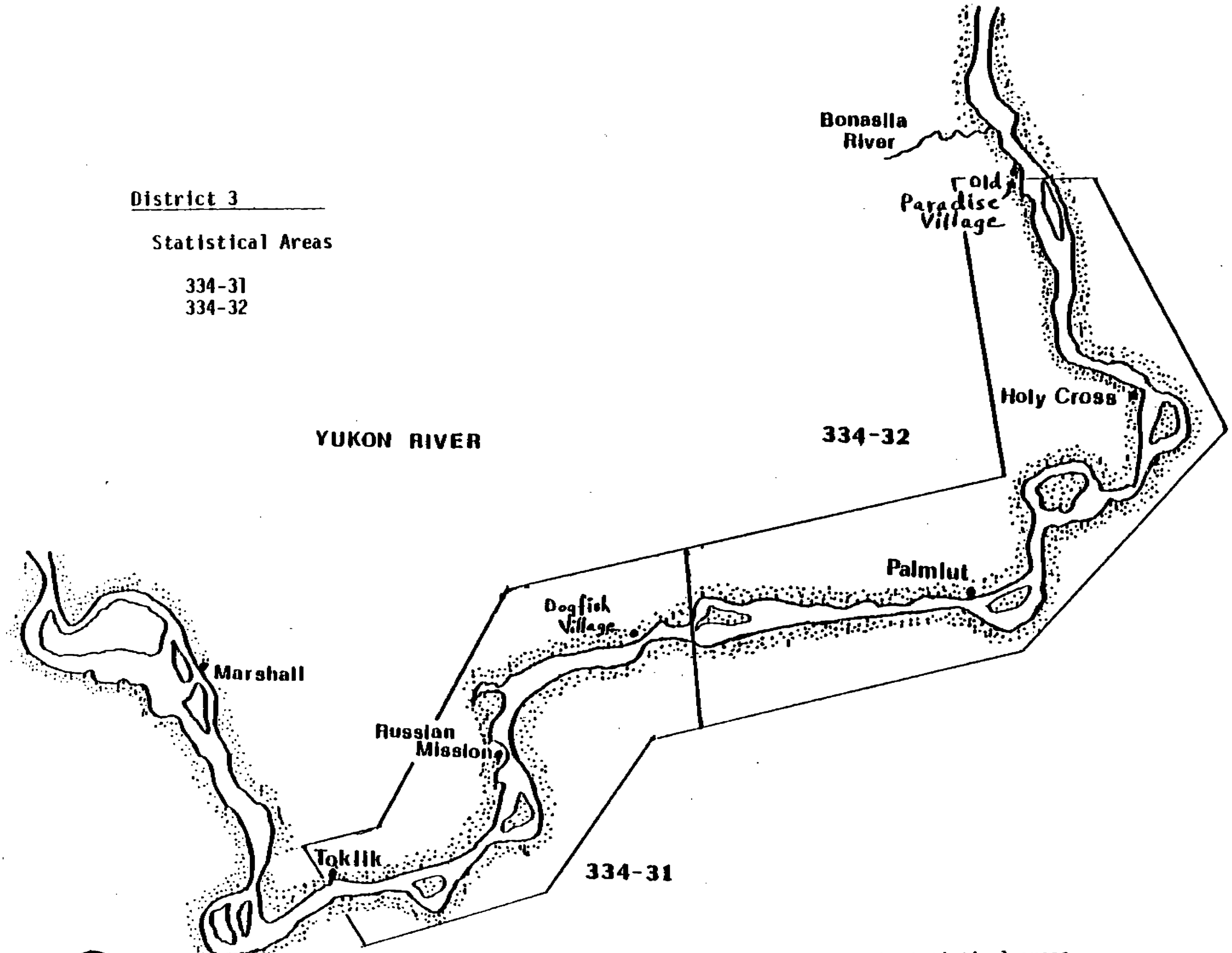


Figure 10. District 3 of [illegible]on management area with statistical areas.

District 5:

Subdistrict	5A	(334-51)
Subdistrict	5B	(334-52)
Subdistrict	5C	(334-53)
Subdistrict	5D	(334-54)

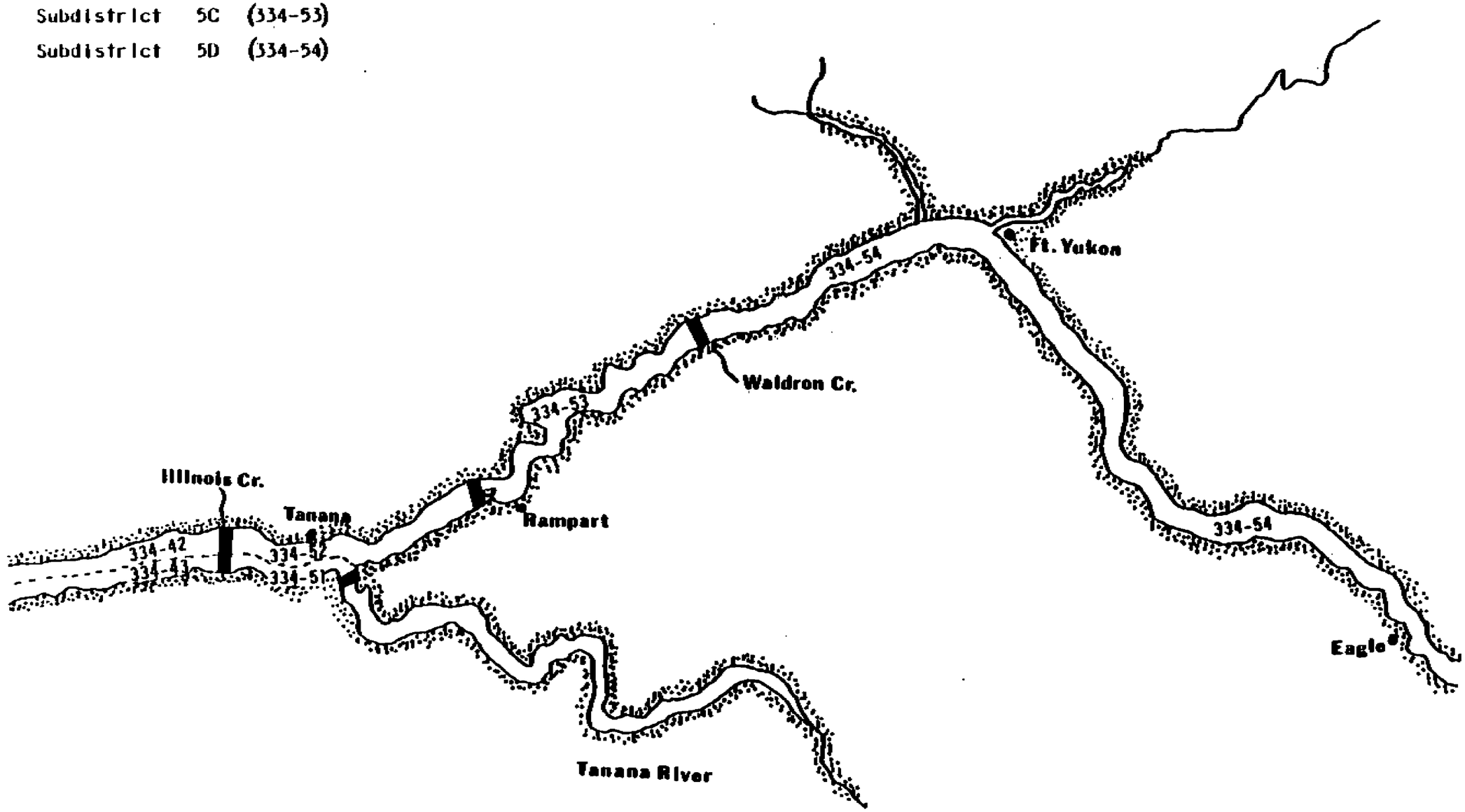
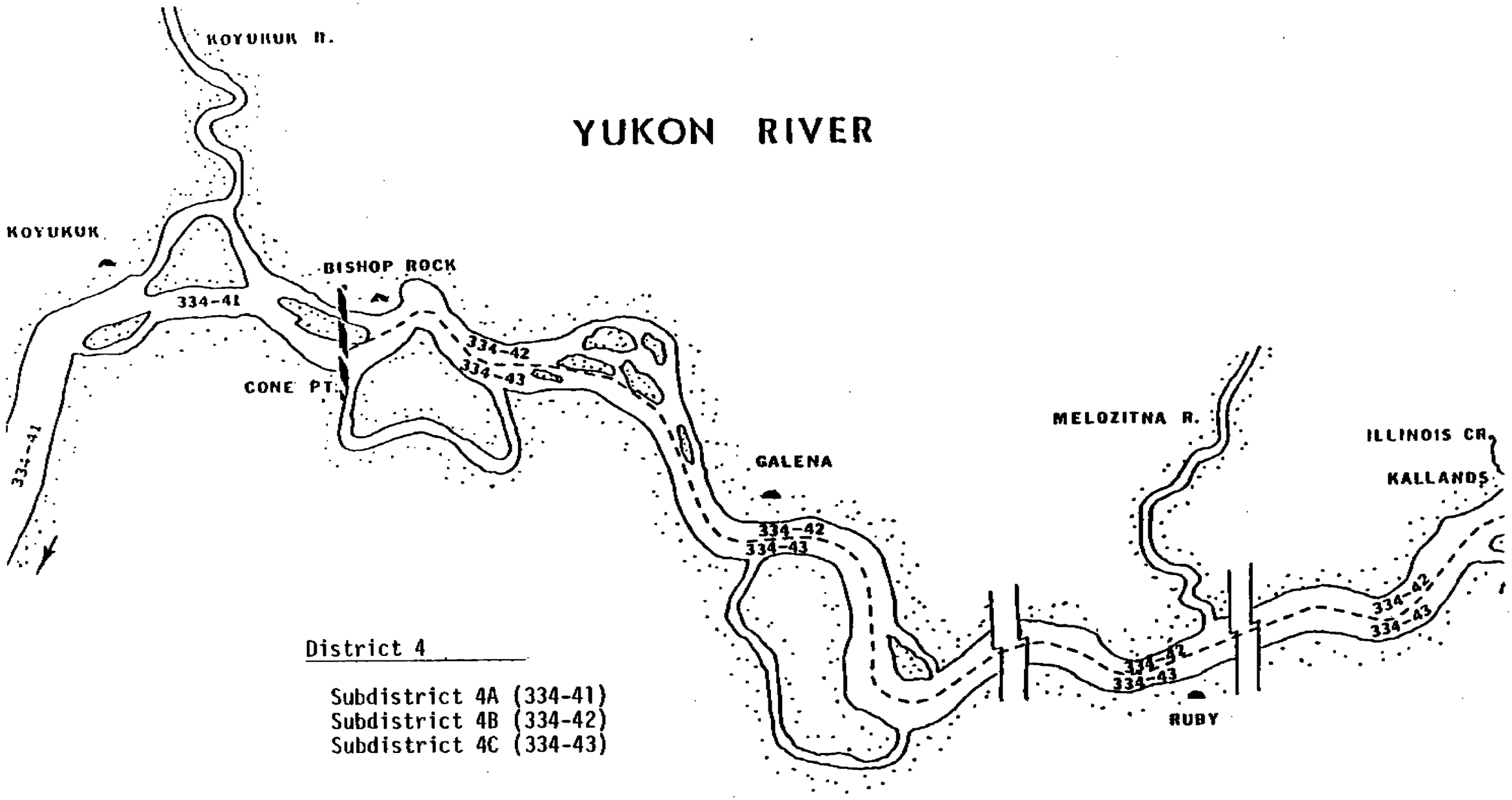


Figure 13. District 5 of Yukon management area with statistical areas.



District 4

Subdistrict 4A (334-41)
Subdistrict 4B (334-42)
Subdistrict 4C (334-43)

Figure 12. District 4 of Yukon management area with statistical areas.

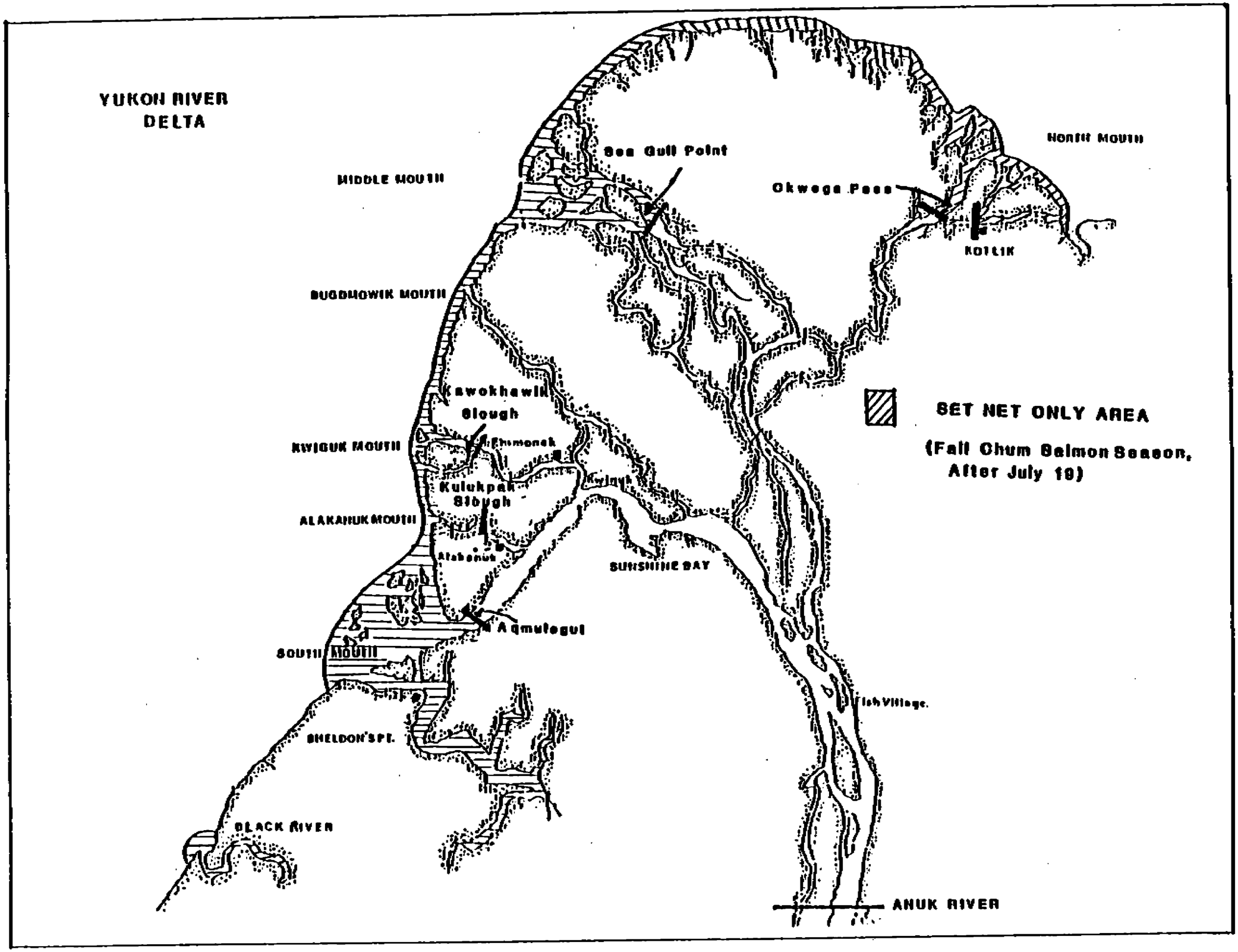
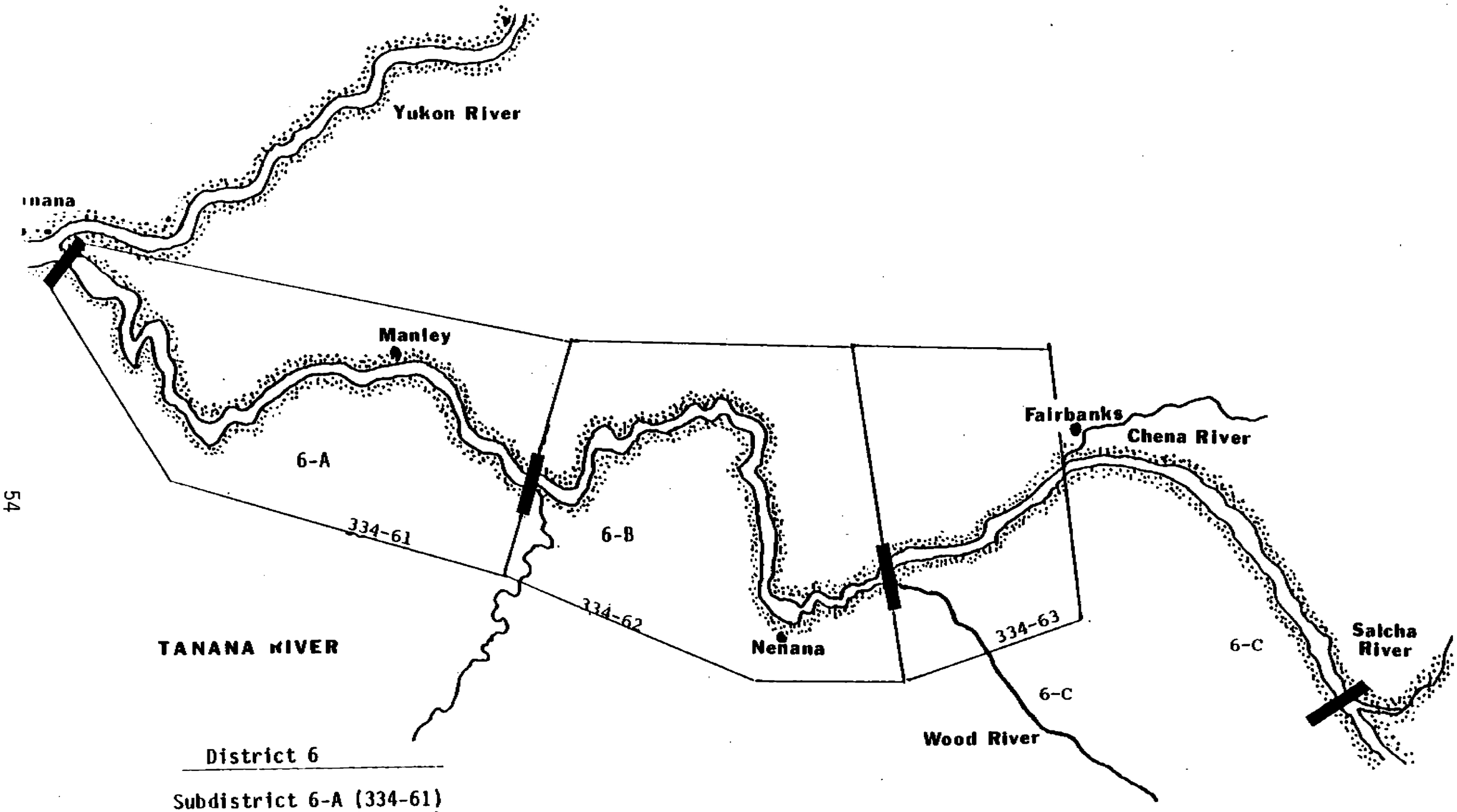


Figure 15. Set net only area, District 1 of the Yukon Management Area.



District 6

Subdistrict 6-A (334-61)
Subdistrict 6-B (334-62)
Subdistrict 6-C
Wood River to Chena R. (334-63)

Figure 14. District 6 of Yukon management area with statistical areas.

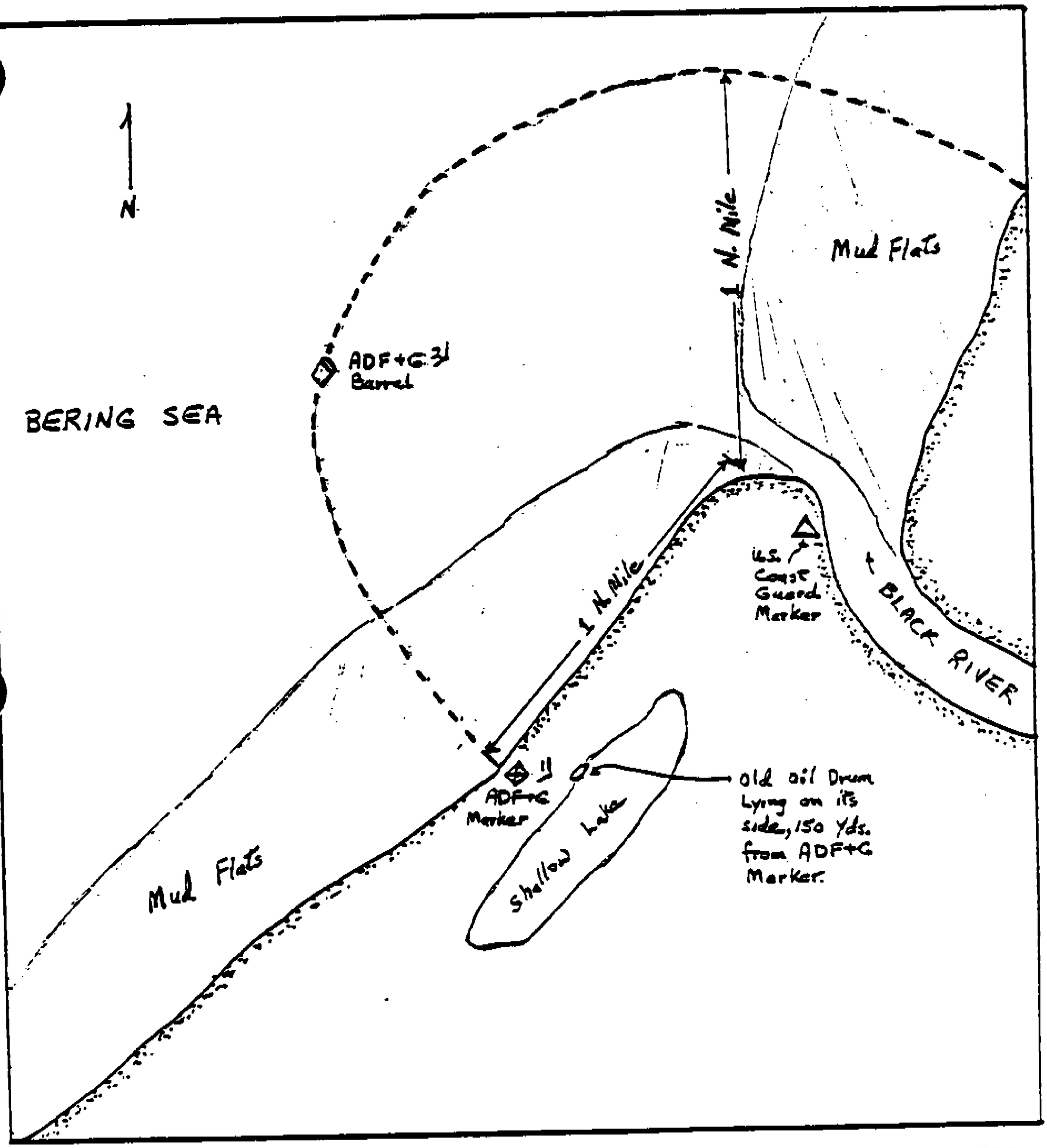


Figure 17. Closed waters of Black River mouth. (5AAC 05.350. CLOSED WATERS. (3) waters west of a one nautical mile radius from the mouth of Black River).

1/ ADF&G Regulatory Marker Sign erected 6' height with driftwood logs.

2/ ADF&G yellow and green 55 gal. barrel anchored 1 nautical mile offshore.

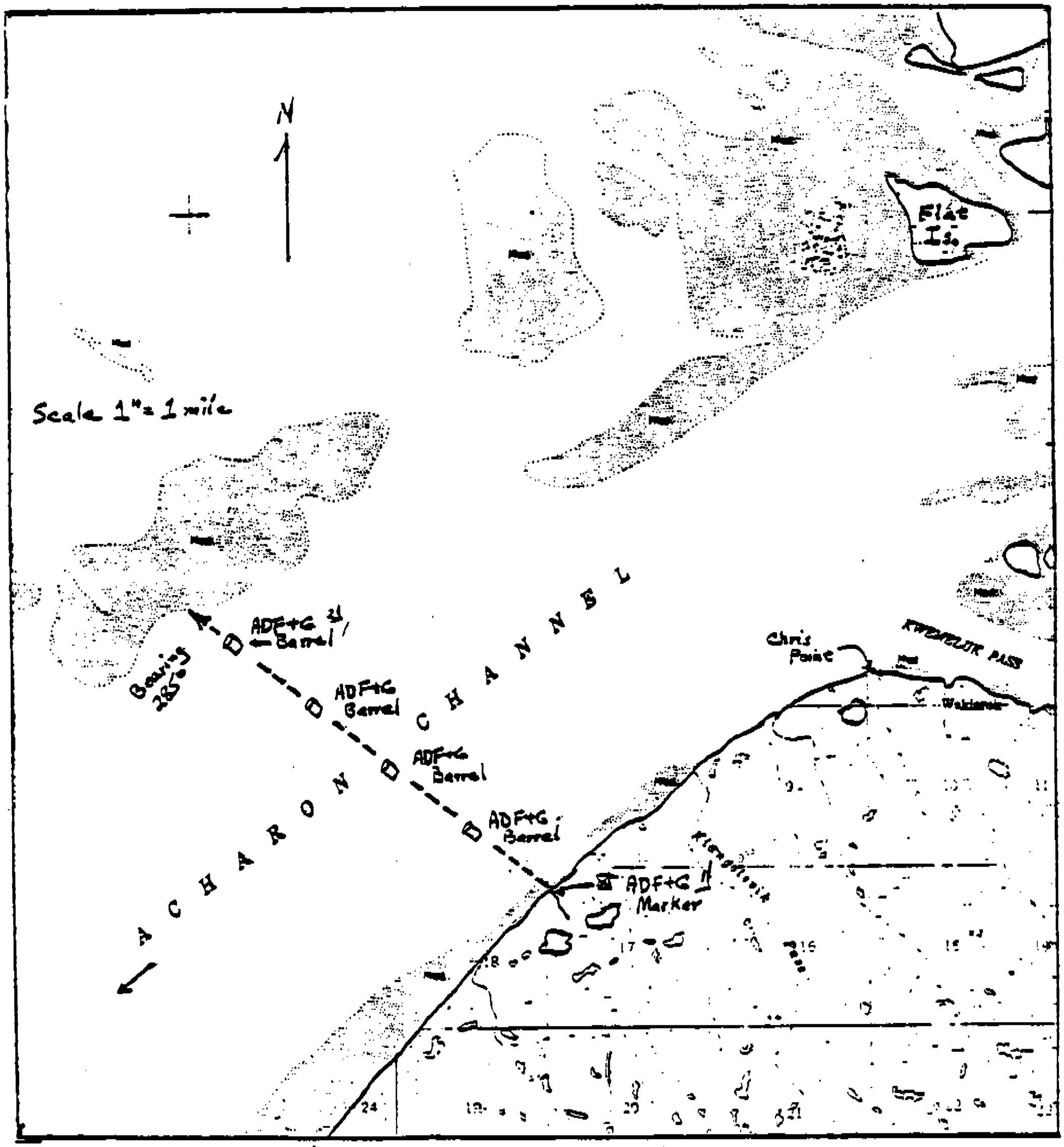


Figure 16. Closed waters Acharon Channel, south mouth Yukon River. (5AAC 05.350. CLOSED WATERS. (1) Acharon Channel of the south mouth area of the Yukon River west of a 2-1/2 nautical mile long line bearing 285° from an ADF&G regulatory marker located below Chris Point to the opposite side of the channel; the line may be marked by a series of yellow and green barrels placed by the Department between shore markers).

1/ ADF&G Regulatory Marker Sign, erected 5' height with driftwood logs, located on river bank at terminus of rivulet between two lakes approximately 2-1/2 miles below Chris Point.

2/ ADF&G yellow and green 55 gal. barrels anchored offshore.

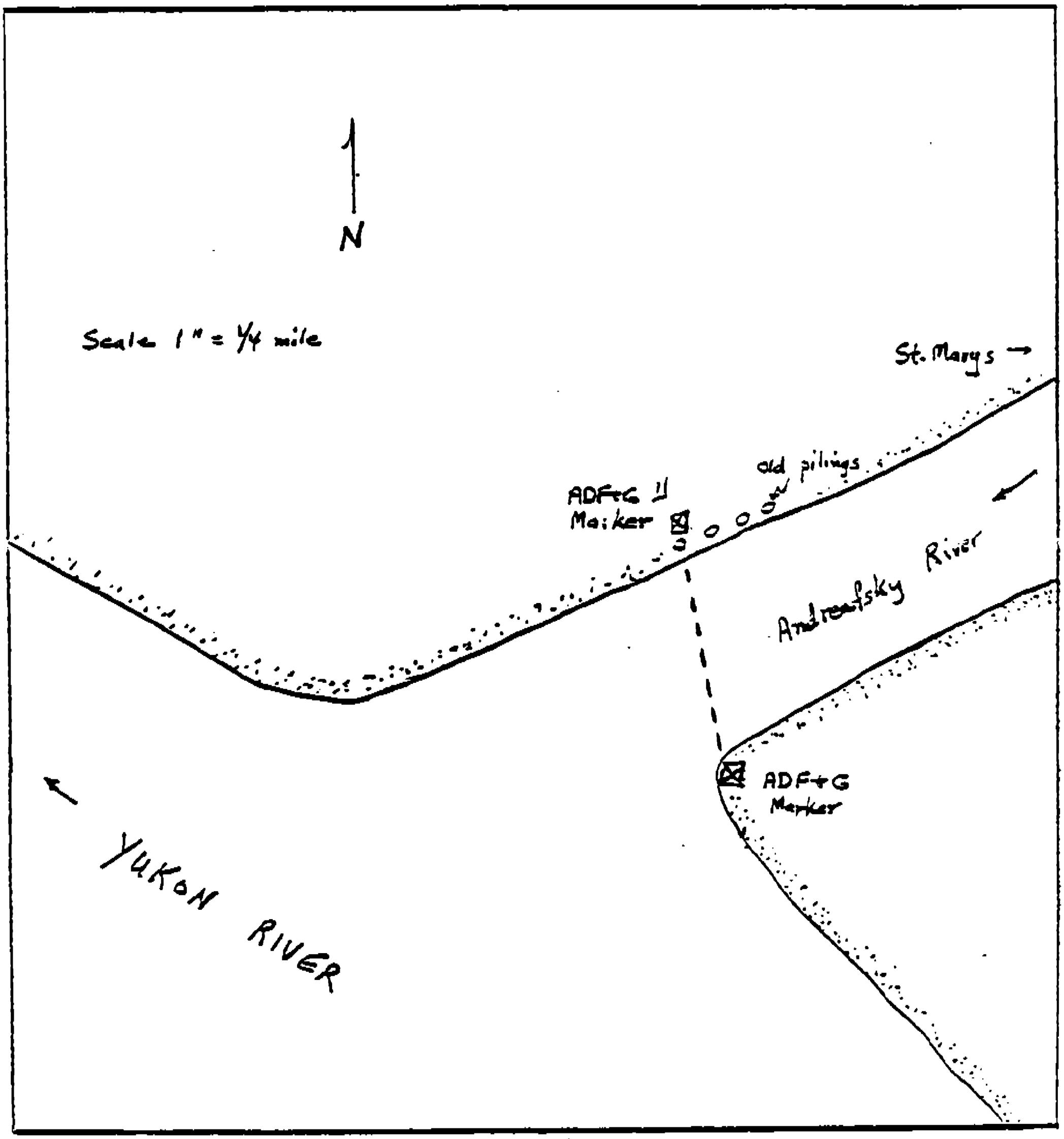


Figure 19. Closed waters of Andreafsky River mouth. (5AAC 05.350. CLOSED WATERS. (4) waters of the Andreafsky River upstream of a line from Department regulatory markers placed on each side of the river at its mouth).

1/ North bank ADF&G regulatory marker sign attached to 4th wooden piling stump downstream.

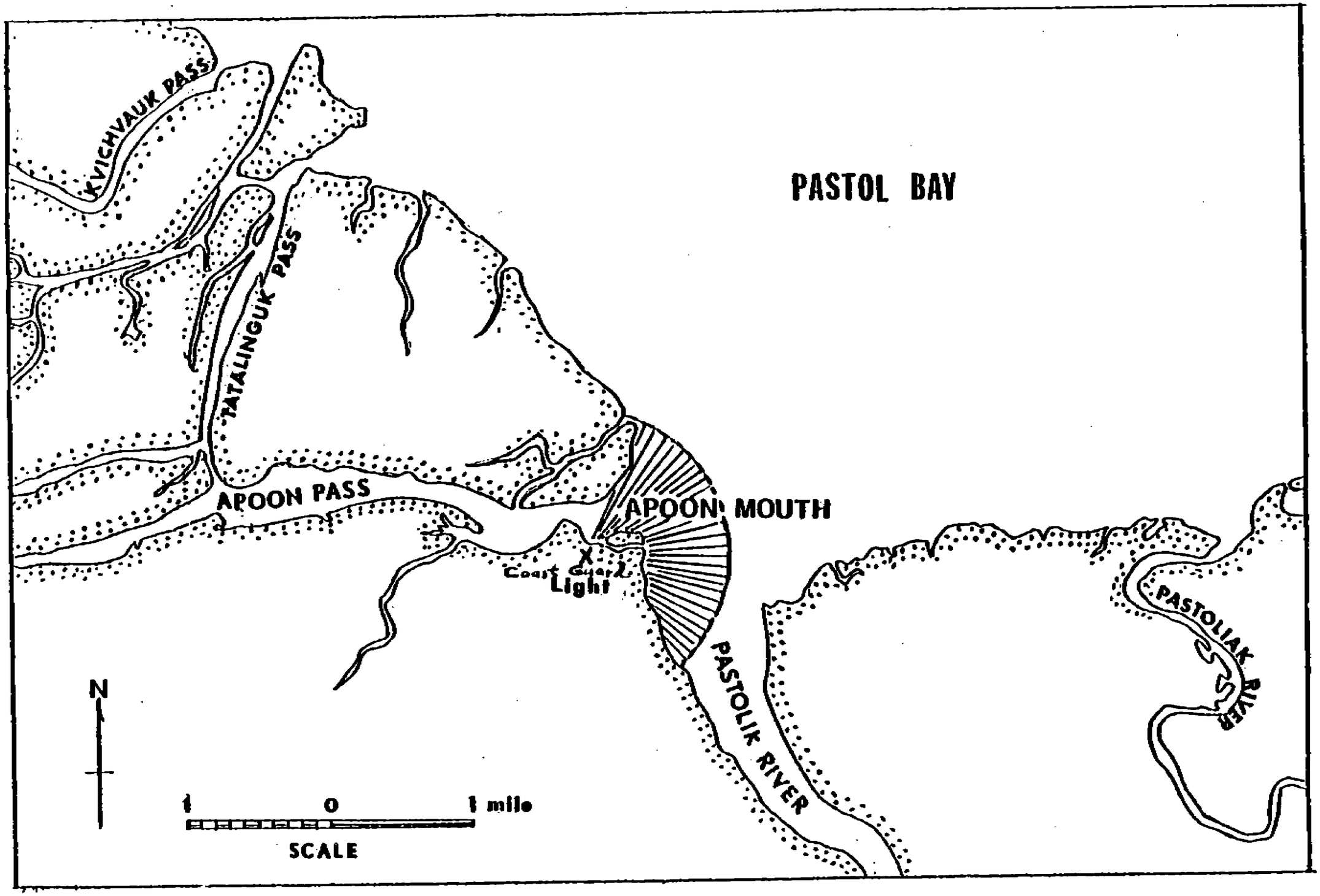


Figure 18. Closed waters of Apoon Mouth, Yukon River (5 AAC 05.350. CLOSED WATERS. (9) Waters east of a one nautical mile radius from a U.S. Coast Guard light at the mouth of Apoon Pass).

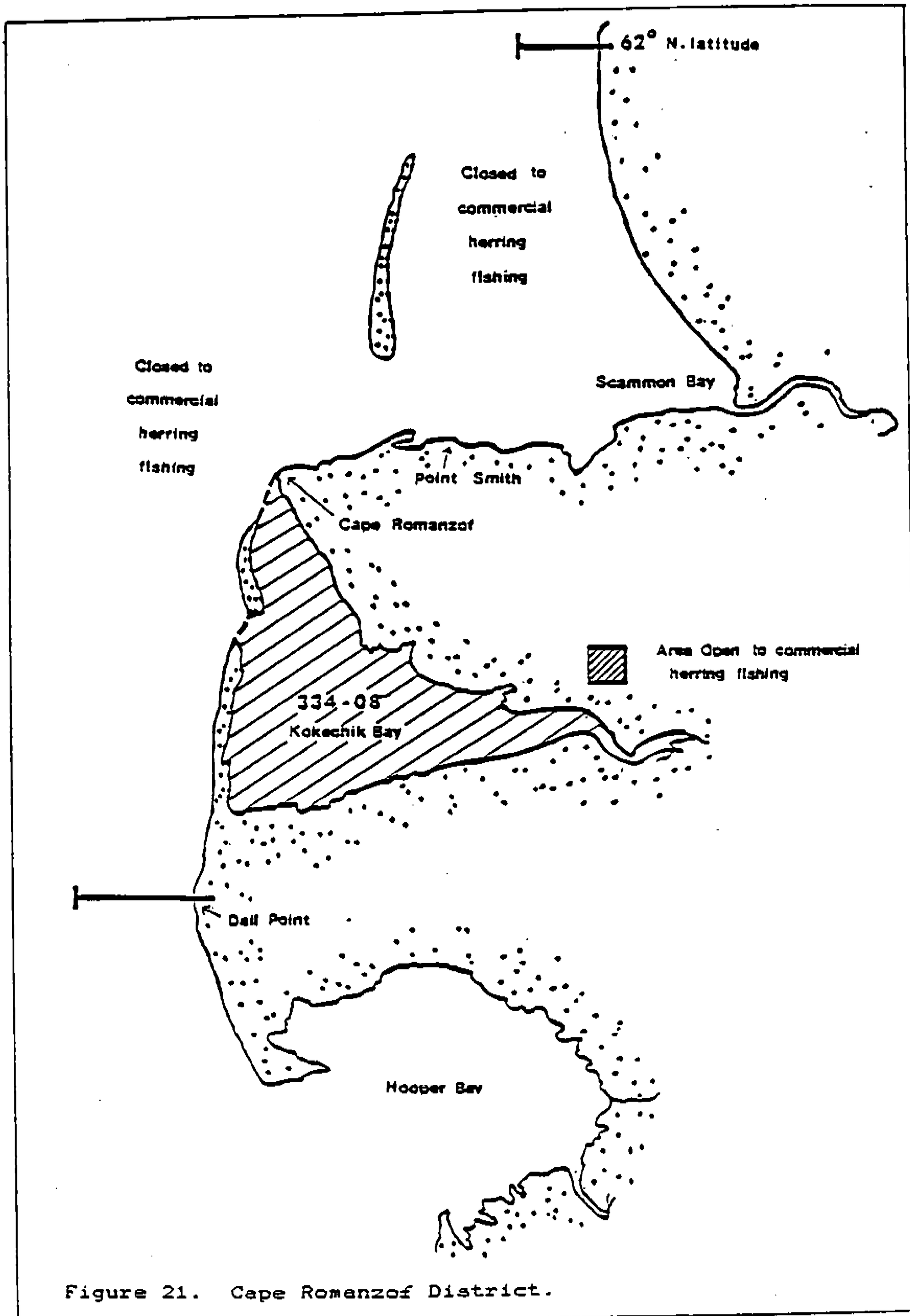


Figure 21. Cape Romanzof District.

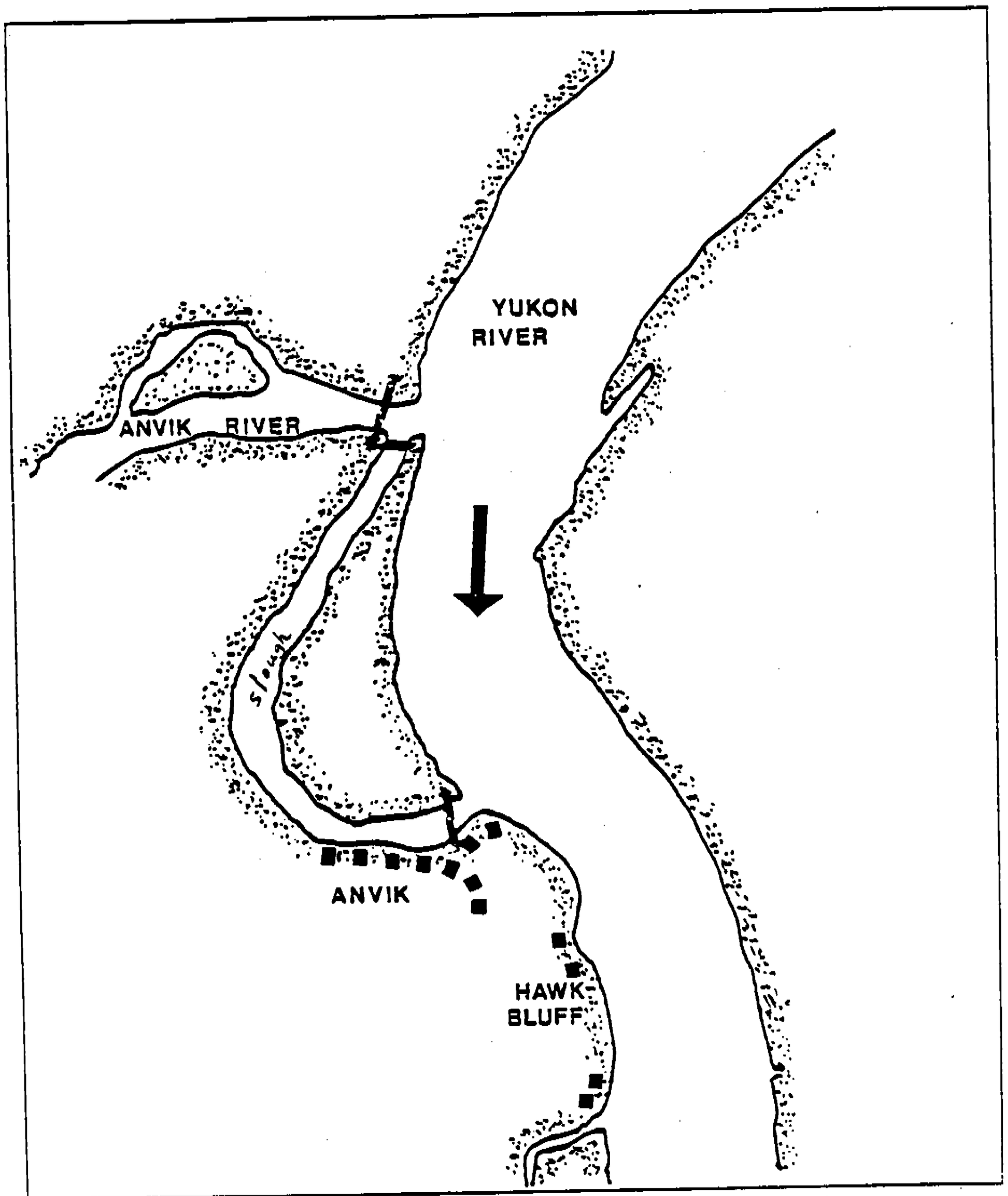


Figure 20. Closed waters of Anvik River mouth. (5AAC 05.350. (CLOSED WATERS (8) waters of the Anvik River upstream of a line between department regulatory markers placed on each side of the river at its mouth). Markers (6) placed north and south banks of the Anvik River mouth and at upstream and downstream mouths of slough (Old Anvik River Channel).

Table 2. Yukon River drainage mileages.

Location	Mileage from Mouth
NORTH MOUTH (APOON PASS)	
Kotlik	6
Hamilton	26
MIDDLE MOUTH (KWIKPAK,KAWANAK PASS)	
Choolunawick	16
Akers Camp	26
New Hamilton	34
SOUTH MOUTH (KWIKLUAK PASS)	
Mouth, Black River	-18
Flat Island	0
Sheldon Point	5
in Can Point	8
Alakanuk	17
Emmonak-Kwiguk (Kwiguk Pass)	24
Sunshine Bay	24
Aproka Pass (upstream mouth)	35
Kwikpak Pass (upstream mouth)	44
Head of Passes	48
Fish Village	52
Mouth, Anuk River	63
(District 1/2 Boundary)	
Patsys Cabin	71
Mountain Village	87
Old Andreafsky	97
Pitkas Point	103
Mouth, Andreafsky River	104
St. Marys	107
Pilot Station	122
Mouth, Atcheulinguk (Chulinak) River	126
Pilot Village	138
Marshall (Fortuna Ledge)	161
Upstream Mouth Owl Slough	163
Ingrihak	170
Ohogamuit	185
(District 2/3 Boundary)	
Kakamut	193
Russian Mission	213
Dogfish Villaage	227
Paimuit	251
Mouth, Innoko River (South Slough)	274
Shageluk	328
Holikachuk	383
Holy Cross	279
Mouth, Koserefski River	286
Old Paradise Village	301
(District 3/4 Boundary)	
Mouth, Bonasila River	306
Anvik	317
Mouth, Anvik River	318
Grayling	36
Mouth, Thompson Creek	349
Blackburn	370
Eagle Slide	402
Mouth, Rodo River	447
Kaltag	450
Mouth, Nulato River	483
Nulato	484
Koyukuk	502
Mouth, Koyukuk River	508
Mouth, Gisasa River	564
Huslia	711
Mouth, Dakli River	755
Mouth, Hogatza River	780
Hughes	881
Mouth, Kanuti River	935
Alatna (Mouth, Alatna R.)	956
Allakaket	956
Mouth, South Fork	986
Mouth, John River	1,117
Bettles	1,121
Middle Fork	1,141
Cold Foot	1,174
Wiseman	1,186

Table 1. List of indigenous fishes found in the Yukon area.[a]

Species Code	Scientific Name	Common Name
601	Lampetra japonica	Arctic lamprey
570	Stenodus leucichthys	sheefish
588	Coregonus nasus	broad whitefish
589	Coregonus pidschian	humpback whitefish
583	Coregonus sardinella	least cisco
585	Coregonus laurettae	Bering cisco
586	Prosopium cylindraceum	round whitefish
587	Prosopium coulteri	pygmy whitefish
610	Thymallus arcticus	Arctic grayling
550	Salvelinus namaycush	lake trout
520	Salvelinus alpinus	Arctic char
530	Salvelinus malma	Dolly Varden
410	Oncorhynchus tshawytscha	chinook salmon
420	Oncorhynchus nerka	sockeye salmon
430	Oncorhynchus kisutch	coho salmon
440	Oncorhynchus gorbuscha	pink salmon
450	Oncorhynchus keta	chum salmon
513	Osmerus mordax dentex	rainbow smelt
514	Hypomesus olidus	pond smelt
500	Esox lucius	Northern pike
630	Dallia pectoralis	blackfish
650	Couesius plumbeus	lake chub
640	Catostomus catostomus	longnose sucker
670	Petcopsis omiscomaycus	trout-perch
590	Lota lota	burbot, lush
661	Pungitius pungitius	nine-spine stickleback
162	Cottus cognatus	slimy sculpin
ESTUARINE		
113	Eleginus gracilis	saffron cod
129	Platichthys stellatus	starry flounder
	Liopsetta glacialis	Arctic flounder
230	Clupea pallasii	Pacific herring
516	Mallotus villosus	capelin

a Includes fishes found in the Yukon River drainage in Canada.

Table 2. (continuation - page 3 of 3)

Location	Mileage from Mouth
U.S.-Canadian border	1,224
Mouth, Fortymile River	1,269
Dawson	1,319
Mouth, Klondike River	1,320
Mouth, Sixty Mile River	1,369
Mouth, Stewart River	1,375
McQuesten	1,455
Stewart Crossing	1,491
Mayo	1,520
Mouth, Hess River	1,594
Mouth, White River	1,386
Mouth, Donjek River	1,455
Mouth Kluane River	1,541
Outlet Kluane L.	1,587
Burwash Landing	1,595
Kluane	1,625
Fort Selkirk	1,477
Mouth, Pelly River	1,478
Pelly Crossing	1,410
Mouth, MacMillan River	1,442
Ross River	1,602
Minto	1,499
Mouth Tatchun Creek	1,530
Carmacks	1,547
Mouth, Little Salmon River	1,583
Mouth, Big Salmon River	1,621
Mouth, N. Big Salmon R.	1,641
Mouth, S. Big Salmon R.	1,657
Outlet, Big Salmon Lake	1,714
Mouth, Teslin River	1,654
Roaring Bull Rapids	1,707
Johnson's Crossing (Outlet, Teslin L.)	1,756
Teslin	1,780
Mouth Nisutlin River	1,788
Mouth, Sidney Creek	1,837
Mouth, Hundred Mi. Creek	1,851
Mouth, NcNeil River	1,887
Outlet, Nisutlin Lake	1,892
Outlet, Lake Laberge	1,679
Inlet, Lake Laberge	1,712
Outlet, Marsh Lake	1,764
Mouth, M'Clintock River	1,769
Outlet, Little Atlin L.	1,788
Outlet, Atlin Lake	1,812
Atlin	1,844
Tagish	1,786
Outlet, Tagish Lake	1,788
Carcross	1,810
(Outlet L.Bennett)	
Bennett	1,835

Table 2. (continuation page 2 of 3)

Location	Mileage from Mouth
Galena	530
Whiskey Creek	555
Mouth, Yuki River	562
Ruby	581
Mouth, Melozitna River	583
Horner Hot Springs	605
Kokrines	608
Mouth, Nowitna River	612
Birches	647
Kallands-Mouth of Illinois Creek (District 4/5 Boundary)	664
Mouth, Tozitna River	681
Tanana Village	695
Mouth, Tanana River (District 5/6 Boundary)	695
Manley Hot Springs	765
Mouth, Kantishna River	793
Mouth, Toklat River	838
Mouth, Sushana R.	850
Mouth, Bearpaw River	887
Outlet, L. Minchumina	959
Minto	835
Nenana	860
Mouth, Nenana River	860
Mouth, Wood River	894
Rosie Creek Bluffs	912
Mouth, Chena R.(Fairbanks)	920
Mouth, Salcha River	965
Benchmark #735 Slough	991
Mouth, Little Delta R.	1,000
Mouth, Delta Creek	1,014
Mouth, Clear Creek (Richardson-Clearwater)	1,015
Mouth, Shaw Creek	1,021
Mouth, Delta River (Big Delta)	1,031
Delta Junction	1,041
Mouth, Goodpaster River	1,049
Bluff Cabin Slough	1,050
Outlet, Clearwater Lake	1,052
Outlet, Clearwater Crk	1,053
Outlet, Healy Lake	1,071
Outlet, Lake George	1,086
Tanacross	1,128
Outlet, Tetlin Lake	1,188
Mouth, Nabesna River	1,210
Northway Junction	1,214
Mouth, Chisana River	1,215
Mouth, Sheep Creek	1,297
Rampart Rapids	731
Rampart	763
Mouth, Hess Creek	789
Mouth, Ray River	817
Highway Bridge - Pipeline Crossing	820
Mouth, Dall River	841
Stevens Village	847
Mouth, Hodzana River	897
Beaver	932
Mouth Hadweenzic River	952
Mouth, Chandalar River (Venetie Landing)	982
Venetie	1,025
Fort Yukon	1,002
Mouth, Porcupine River	1,002
Mouth, Black River	1,026
Chalkyitsik	1,084
Mouth, Salmon Fork R.	1,142
Mouth, Sheenjek River	1,054
Mouth, Coleen River	1,157
Mouth, Salmon Trout R.	1,193
U.S. - Canadian Border	1,219
Old Crow	1,259
Fishing Branch R. spawning area	1,600
Circle	1,061
Woodchopper	1,110
Mouth, Charley River	1,124
Mouth, Kandik River	1,135
Mouth, Nation River	1,166
Mouth, Tatonduk River	1,186
Mouth, Seventymile River	1,194

Table 3. Yukon area processors and associated data, 1988 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Amukon Salt General Delivery Scammon Bay, AK 99662 (Black River)	Hard Salt Chinook Chum Coho	1
Bering Sea Fisheries, Inc. 4413 83rd Ave. SE Everett, WA 98205 (Lamont Slough)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Anpac, Inc. P.O. Box 92520 Anchorage, AK 99509 (Emmonak and Mt. Village)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Schenk Seafood Sales, Inc. P.O. Box 984 Bellingham, WA 98227 (Lamont Slough)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Boreal Fisheries P.O. Box 561 Graham, WA 98338 (Old Andreafsky)	Fresh Salmon Chinook Chum Coho Salmon Roe	1 and 2
Yupik Star Fisheries/Maro, Inc. P.O. Box 88 Emmonak, AK 99581 (Alakanuk)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2
Nakamura & Associates, Inc. 811 First Ave., Suite 400 Colman Building Seattle, WA 98104 (Marshall)	Fresh Salmon Chinook Chum Coho Salmon Roe	2 and 3

-Continued-

Table 3. Yukon area processors and associated data, 1988.

Commercial operation (Processing location/ buying station)	Product	District
Icicle Seafoods, Inc. 4019 21st Ave. W. Seattle, WA 98199 (M/V Lady Ann, M/V Pintail, M/V Chichagof)	Sac Roe Herring (frozen)	Cape Romanzof
Lafayette, Inc. 4259 22nd Ave. W. Seattle, WA 98199 (P/V Pribilof, P/V Lafayette, M/V Northwind, M/V Tracy D., M/V Chathom, M/V Zingaro)	Sac Roe Herring (frozen)	Cape Romanzof
Pan Pacific Seafoods, Inc. 150 Nickerson St., Suite 108 Seattle, WA 98109 (P/V Pacific Producer, M/V North Point)	Sac Roe Herring (frozen)	Cape Romanzof
Trident Seafoods 5303 Shilshole Ave. NW Seattle, WA 98107 (P/V Bristol Monarch, M/V Lowboy, M/V Pankoff, M/V Dritsik)	Sac Roe Herring (frozen)	Cape Romanzof
Woodbine Alaska Fish Co. P.O. Box 218 Naknek, AK 99633 (M/V Tonto)	Sac Roe Herring (frozen)	Cape Romanzof
YAK, Inc. 4019 21st Ave. W. #202 Seattle, WA 98199 (P/V Yard Arm Knot, M/V Blue Fin)	Sac Roe Herring (frozen)	Cape Romanzof
Yukon Delta Fish Marketing Co-op, Inc. P.O. Box 169 Emmonak, AK 99581 (Emmonak)	Frozen Salmon Chinook Chum Coho Salmon Roe	1 and 2

-Continued-

Table 3. Yukon area processors and associated data, 1988 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Yutana Fisheries P.O. Box 82556 College, AK 99708 (Manley)	Frozen Salmon Chinook Chum Coho Salmon Roe	5 and 6
Circle Fish Co. P.O. Box 14 Circle, AK 99733 (Circle)	Frozen Salmon Chinook Chum Salmon Roe	5
Eagle Seafoods P.O. Box 4085 Soldotna, AK 99669	Fresh Salmon Chinook Chum Coho Salmon Roe	5 and 6
Aurora Meat & Seafoods 1250 Aurora Drive Fairbanks, AK 99701 (Fairbanks)	Frozen Salmon Chinook	5
K.O. Kan, Inc. 1209 Skypoke Fairbanks, AK 99709 (Fairbanks)	Frozen Salmon Chinook	5
Denny Mac Enterprizes, Inc. P.O. Box 289 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho Salmon Roe	5 and 6
Aurora Fisheries Co. P.O. Box 83618 Fairbanks, AK 99708 (Fairbanks)	Frozen Salmon Chinook Chum Coho	6
Stevens Fisheries P.O. Box 38 Nenana, AK 99760 (Nenana)	Frozen Salmon Chum Coho	6

Table 3. Yukon area processors and associated data, 1988 (Continued).

Commercial operation (Processing location/ buying station)	Product	District
Y-K Fisheries P.O. Box 213 McGrath, AK 99627 (St. Marys)	Fresh Salmon Chinook Chum Coho Salmon Roe	2
Azuma Corporation Ltd. 520 W. 58th Ave. Anchorage, AK 99518 (Aniak P.O. Box 19)	Smoked Salmon Chinook Chum Coho Salmon Roe	3 and 4
Walton Seafoods P.O. Box 258 McGrath, AK 99827 (Anvik)	Salmon Roe	4
Great Northern Seafoods 2604 Fairbanks St. Suite B Anchorage, AK 99503 (Galena)	Salmon Roe	4
Whitney Foods P.O. Box 190429 Anchorage, AK 99503 (Nulato)	Frozen Salmon Salmon Roe	4
Towa Americana, Inc. 424 East Manor Ave. Anchorage, AK 99501 (Galena, Nulato)	Frozen Salmon Chinook Chum Coho Salmon Roe	4
Umphenour and Marshall, Inc. 878 Lynnwood Way North Pole, AK 99705 (North Pole)	Frozen Salmon Smoked Salmon Chinook Chum Coho Salmon Roe	5 and 6

-Continued-

Table 4. Yukon area commercial salmon and salmon roe sales by statistical area, 1988. a,b

Statistical Area	Summer Season c			Fall Season d				Total				
	Chinook	Chum	Chum Roe e	Chinook	Chum	Chum Roe e	Coho	Chinook	Chum	Chum Roe e	Coho	Pink f
334-11	6,776	72,408	0	4	10,217	0	1,652	6,780	82,625	0	1,652	0
12	11,145	148,578	0	9	6,953	0	5,831	11,154	155,531	0	5,831	137
13	6,023	79,248	0	0	2,625	0	1,866	6,023	81,873	0	1,866	571
14	4,274	60,965	0	0	206	0	392	4,274	61,171	0	392	246
15	14,119	61,752	0	4	6,692	0	9,166	14,123	68,444	0	9,166	14
16	618	13,239	0	0	3,905	0	9,848	618	17,144	0	9,848	6
17	8,701	129,938	0	2	9,526	0	4,831	8,703	139,464	0	4,831	26
18	5,433	82,070	0	1	5,405	0	2,849	5,434	87,475	0	2,849	1
Subtotal District 1	57,089	648,198	0	20	45,529	0	36,435	57,109	693,727	0	36,435	1,001
334-21	6,191	74,252	0	0	5,077	0	3,844	6,191	79,329	0	3,844	55
22	11,602	140,291	0	3	13,215	0	12,503	11,605	153,506	0	12,503	1
23	4,719	56,302	0	2	5,385	0	4,891	4,721	61,687	0	4,891	0
24	6,782	88,393	0	2	4,283	0	7,141	6,784	92,676	0	7,141	0
25	5,887	65,934	0	0	3,901	0	6,397	5,887	69,835	0	6,397	0
Subtotal District 2	35,181	425,172	0	7	31,861	0	34,776	35,188	457,033	0	34,776	56
334-31	1,387	11,463	0	0	1,748	0	1,291	1,387	13,211	0	1,291	0
32	380	2,502	0	0	342	0	128	380	2,844	0	128	0
Subtotal District 3	1,767	13,965	0	0	2,090	0	1,419	1,767	16,055	0	1,419	0
TOTAL LOWER YUKON	94,037	1,087,335	0	27	79,480	0	72,630	94,064	1,166,815	0	72,630	1,057
334-41	19	19,070	230,276	0	0	0	0	19	19,070	230,276	0	0
42	1,597	4,592	21,766	2	10,157	703	2	1,599	14,749	22,469	2	0
43	1,534	389	2,484	7	5,505	718	0	1,541	5,894	3,202	0	0
Subtotal District 4	3,150	24,051	254,526	9	15,662	1,421	2	3,159	39,713	255,947	2	0
334-51	0	0	0	0	0	0	0	0	0	0	0	0
52	1,498	717	337	0	9,684	0	0	1,498	10,401	337	0	0
53	1,477	5	26	0	4,533	0	0	1,477	4,538	26	0	0
54	461	0	0	0	2,772	0	8	461	2,772	0	8	0
Subtotal District 5	3,436	722	363	0	16,989	0	8	3,436	17,711	363	8	0
334-61	305	7,978	71	0	4,500	0	1,240	305	12,478	71	1,240	0
62	253	24,911	1,165	0	13,617	1,035	10,372	253	38,528	2,200	10,372	0
63	204	7,240	410	0	3,727	771	2,360	204	10,967	1,181	2,360	0
Subtotal District 6	762	40,129	1,646	0	21,844 g	1,806	13,972 h	762	61,973	3,452	13,972	0
TOTAL UPPER YUKON	7,348	64,902	256,535	9	54,495 g	3,227	13,982 h	7,357	119,397	259,762	13,982	0
GRAND TOTAL YUKON AREA	101,385	1,152,237	256,535	36	133,975 g	3,227	86,612 h	101,421	1,286,212	259,762	86,612	1,057

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b Refer to Table 13 for estimates of total commercial related harvest.

c Summer Season

District 1	6/09-7/15	District 4	6/19-8/01
District 2	6/12-7/14	District 5	6/15-7/14
District 3	6/19-6/30	District 6	7/01-8/17

d Fall Season

District 1	8/08-8/30	District 4	8/07-8/30
District 2	8/10-8/31	District 5	8/11-9/14
District 3	8/10-8/21	District 6	9/09-9/21

e May include small amounts of chinook and coho salmon roe.
f Pink salmon catches occurred between 6/27-8/31.
g Does not include 26,988 fall chum salmon sold as part of a new test fishing project in District 6.
h Does not include 13,295 coho salmon sold as part of a new test fishing project in District 6.

Table 5. Yukon Area Commercial Fisheries Entry Commission salmon gear permits issued by residence, 1988.

District	Residence	Gillnet Permits	Fishwheel Permits
1, 2 and 3	Emmonak	101	
	Mountain Village	97	
	Alakanuk	80	
	Kotlik	70	
	St. Marys	68	
	Marshall	50	
	Pilot Station	49	
	Scammon Bay	39	
	Sheldon Point	21	
	Russian Mission	16	
	Anchorage	14	
	Holy Cross	13	
	Bethel	12	
	Fairbanks	11	
	Stebbins	10	
	Unalakleet	6	
	Wasilla	4	
	Shaktoolik	3	
	Pitkas Point	2	
	Chevak	2	
	Kenai	2	
	Nome	2	
	Sitka	2	
	Aniak	1	
	Big Lake	1	
	Cooper Landing	1	
	Deering	1	
	Dillingham	1	
	Eagle River	1	
	Eek	1	
	Elim	1	
	Fort Yukon	1	
	Iliamna	1	
	Manley Hot Springs	1	
	Napakiak	1	
	Red Devil	1	
	Salcha	1	
	Seward	1	
	St. Michael	1	
	Talkeetna	1	
	Tok	1	
	Cameron Mills, NY	1	
	Everett, WA	1	
	Gig Harbor, WA	1	
	Onalaska, WA	1	
	Rock Hill, SC	1	
	Seattle, WA	1	
	Troy, MT	1	
Total Lower Yukon		699 a	
4,5 and 6	Anchor Pt.	0	2
	Anchorage	3	2
	Anvik	1	5
	Cantwell	0	1
	Circle	0	1
	Clear	0	2
	College	0	1
	Dillingham	0	1
	Fairbanks	14	19
	Ft. Yukon	0	1
	Galena	5	21
	Grayling	3	6
	Holy Cross	1	0
	Huslia	0	1
	Kaltag	2	13
	Koyukuk	0	3
	Manley	0	5
	McGrath	0	1
	McKinley Park	0	1
	Minto	0	0
	Nenana	7	19
	Nikiski	1	0
	North Pole	1	3
	Nulato	1	19
	Rampart	1	2
	Ruby	1	10
	Salcha	0	1
	Soldotna	1	0
	Stevens Village	0	2
	Tanana	5	13
Total Upper Yukon		47	155
Grand Total Yukon Area		746	155

a Does not include transfers.

Table 6. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 1, Yukon area, 1988. a

Period No.	Period Dates	Hours Fished	No. of Fisher-men	Period Catch and Catch Per Unit Effort								Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Pink	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
2	6/13-6/14	12	388	5,862	1.26	0	0.00	46,383	9.96	0	0.00	5,862	1.26	0	0.00	46,383	9.96
4	6/16-6/17	12	400	15,971	3.33	0	0.00	91,647	19.09	0	0.00	21,833	2.31	0	0.00	138,030	14.60
5	6/20-6/21	12	402	10,959	2.27	0	0.00	21,186	4.39	0	0.00	32,792	2.30	0	0.00	159,216	11.15
Subtotal b		36	437	32,792	2.30	0	0.00	159,216	11.15	0	0.00						
1	6/09-6/10	12	374	3,330	0.74	0	0.00	64,010	14.26	0	0.00	3,330	0.74	0	0.00	223,226	11.89
3	6/15	6	280	1,650	0.98	0	0.00	42,824	25.49	0	0.00	4,980	0.81	0	0.00	266,050	13.01
6	6/23-6/24	12	410	8,773	1.78	0	0.00	148,242	30.13	5	0.00	13,753	1.24	0	0.00	414,292	16.33
7	6/27-6/28	12	392	3,280	0.70	0	0.00	38,744	8.24	49	0.02	17,033	1.08	0	0.00	453,036	15.07
8	6/30-7/01	24	398	4,588	0.48	0	0.00	119,891	12.55	148	0.07	21,621	0.85	0	0.00	572,927	14.46
9	7/04-7/05	24	312	1,610	0.22	0	0.00	33,269	4.44	774	2.24	23,231	0.71	0	0.00	606,196	12.87
10	7/07-7/08	12	278	601	0.18	0	0.00	20,706	6.21	0	0.00	23,832	0.66	0	0.00	626,902	12.43
11	7/11-7/12	12	222	268	0.10	0	0.00	9,712	3.65	0	0.00	24,100	0.62	0	0.00	636,614	11.99
12	7/14-7/15	12	215	197	0.08	0	0.00	11,584	4.49	0	0.00	24,297	0.59	0	0.00	648,198	11.64
Subtotal c		162	456	24,297	0.59	0	0.00	648,198	11.64	976	0.02						
13	8/08-8/09	12/6	284	8	0.00	8,410	3.59	32,480	13.88	15	0.01	24,305	0.56	8,410	3.59	32,480	13.88
14	8/18-8/19	12/6	164	2	0.00	2,543	1.83	533	0.38	2	0.00	24,307	0.54	10,953	2.93	33,013	8.85
15	8/22-8/23	12/6	246	5	0.00	11,714	5.95	6,870	3.49	6	0.00	24,312	0.52	22,667	3.98	39,883	7.00
16	8/25-8/26	12/6	198	2	0.00	7,884	5.28	4,109	2.75	0	0.00	24,314	0.50	30,551	4.25	43,992	6.12
17	8/29-8/30	12/6	178	3	0.00	5,884	2.66	1,537	0.69	2	0.00	24,317	0.48	36,435	3.87	45,529	4.84
Subtotal d		60/30	328	24,317	0.48	36,435	3.87	45,529	4.84	1,001	0.02						
Grand Total		222/192	460	57,109		36,435		693,727		1,001							

a Catches reported in numbers of fish sold in the round.
b Chinook salmon season, no mesh size restrictions.
c Summer chum salmon season (6/09 to 7/15). Six inch maximum mesh size restriction in effect during periods 1, 3, and 6-12. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.
d Fall chum salmon season (8/08 to 8/30). The district was divided into a Set Net Only (12 hour) area and a Gill Net (6 hour) area.

Table 7. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 2, Yukon area, 1988. a

Period No.	Period Dates	Hours Fished	No. of Fisher-men	Period Catch and Catch Per Unit Effort								Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Pink	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
2	6/15-6/16	12	211	2,666	1.05	0	0.00	12,899	5.09	0	0.00	2,666	1.05	0	0.00	12,899	5.09
4	6/19-6/20	12	222	9,031	3.39	0	0.00	32,012	12.02	0	0.00	11,697	2.25	0	0.00	44,911	8.64
5	6/22-6/23	12	224	8,312	3.09	0	0.00	20,922	7.78	0	0.00	20,009	2.54	0	0.00	65,833	8.35
Subtotal b		36	234	20,009	2.54	0	0.00	65,833	8.35	0	0.00						
1	6/12-6/13	12	222	1,705	0.64	0	0.00	39,339	14.77	0	0.00	1,705	0.64	0	0.00	105,172	9.97
3	6/17	6	188	852	0.76	0	0.00	28,024	24.84	0	0.00	2,557	0.67	0	0.00	133,196	11.41
6	6/26-6/27	12	227	4,526	1.66	0	0.00	91,587	33.62	0	0.00	7,083	1.09	0	0.00	224,783	15.61
7	6/29-6/30	24	228	3,912	0.71	0	0.00	59,487	10.87	0	0.00	10,995	0.92	0	0.00	284,270	14.31
8	7/03-7/04	24	215	2,229	0.43	0	0.00	70,792	13.72	54	0.06	13,224	0.77	0	0.00	355,062	14.18
9	7/06-7/07	24	199	1,277	0.27	0	0.00	39,730	8.32	0	0.00	14,501	0.66	0	0.00	394,792	13.24
10	7/10-7/11	12	167	451	0.23	0	0.00	15,733	7.85	0	0.00	14,952	0.62	0	0.00	410,525	12.90
11	7/13-7/14	12	137	220	0.13	0	0.00	14,647	8.91	0	0.00	15,172	0.59	0	0.00	425,172	12.71
Subtotal c		162	250	15,172	0.59	0	0.00	425,172	12.71	54	0.00						
12	8/10	6	173	3	0.00	2,682	2.58	16,018	15.43	0	0.00	15,175	0.57	2,682	2.58	16,018	15.43
13	8/17	6	210	3	0.00	13,068	10.37	9,482	7.53	0	0.00	15,178	0.54	15,750	6.85	25,500	11.10
14	8/21	6	164	0	0.00	6,935	7.05	2,126	2.16	1	0.00	15,178	0.53	22,685	6.91	27,626	8.42
15	8/28	6	200	0	0.00	8,181	6.82	3,133	2.61	0	0.00	15,178	0.51	30,866	6.89	30,759	6.86
16	8/31	6	148	1	0.00	3,910	4.40	1,102	1.24	1	0.00	15,179	0.49	34,776	6.48	31,861	5.93
Subtotal d		30	233	15,179	0.49	34,776	6.48	31,861	5.93	56	0.00						
Grand Total		192	260	35,188		34,776		457,033		56							

a Catches reported in numbers of fish sold in the round.
b Chinook salmon season, no mesh size restrictions.
c Summer chum salmon season (6/12 to 7/14). Six inch maximum mesh size restriction in effect during periods 1, 3, and 6-11. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.
d Fall chum salmon season (8/10 to 8/31).

Table 8. Commercial salmon catch and effort data by fishing period, set and drift gill nets combined, District 3, Yukon area, 1988. a

Period No.	Period Dates	Hours Fished	No. of Fishermen	Period Catch and Catch Per Unit Effort						Cumulative Catch and Catch Per Unit Effort					
				Chinook	CPUE	Coho	CPUE	Chum	CPUE	Chinook	CPUE	Coho	CPUE	Chum	CPUE
1	6/19-6/20	12	11	297	2.25	0	0.00	1,358	10.29	297	2.25	0	0.00	1,358	10.29
2	6/22-6/23	12	13	995	6.38	0	0.00	1,588	10.18	1,292	4.49	0	0.00	2,946	10.23
Subtotal b		24	13	1,292	4.49	0	0.00	2,946	10.23						
3	6/26-6/27	12	17	309	1.51	0	0.00	5,394	26.44	309	1.51	0	0.00	8,340	16.95
4	6/29-6/30	24	16	166	0.43	0	0.00	5,625	14.65	475	0.81	0	0.00	13,965	15.94
Subtotal c		60	22	475	0.81	0	0.00	13,965	15.94						
5	8/10	6	3	0	0.00	10	0.56	98	5.44	475	0.78	10	0.56	98	5.44
6	8/17	6	12	0	0.00	641	8.90	1,450	20.14	475	0.70	651	7.23	1,548	17.20
7	8/21	6	10	0	0.00	768	12.80	542	9.03	475	0.64	1,419	9.46	2,090	13.93
Subtotal d		18	13	475	0.64	1,419	9.46	2,090	13.93						
Season Total		78	24	1,767		1,419		16,055							

a Catches reported in numbers of fish sold in the round.
b Chinook salmon season, no mesh size restrictions.
c Summer chum salmon season (6/19 to 6/30). Six inch maximum mesh size restriction in effect after 6/23. Chinook salmon subtotal represents catch during restricted mesh size fishing periods.
d Fall chum salmon season (8/10 to 8/21).

Table 9. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 4, Yukon area, 1988. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
6/19-6/21	48	52	0	1,557	5,108	0
6/22-6/24	48	64	92	1,862	7,193	0
6/26-6/28	48	79	131	3,890	28,109	0
6/29-7/01	48	83	263	7,305	35,732	0
7/03-7/05	48	88	779	3,795	48,160	0
7/06-7/08	48	89	858	2,959	37,684	0
7/10-7/12	48	87	506	1,138	31,509	0
7/13-7/15	48	78	241	369	24,893	0
7/17-7/19	48	67	106	324	13,773	0
7/20-7/22	48	63	79	135	9,983	0
7/24-7/26	48	40	42	44	7,034	0
7/27-7/29	48	42	50	454	4,747	0
7/31-8/01	30	15	3	219	601	0
Subtotal c	606	95	3,150	24,051	254,526	0
8/07-8/09	48	13	6	2,015	194	0
8/10-8/12	48	12	2	1,997	198	0
8/14-8/16	48	12	1	1,275	156	0
8/17-8/19	48	10	0	577	129	0
8/21-8/23	48	11	0	2,073	212	2
8/24-8/26	48	14	0	3,806	275	0
8/28-8/30	48	14	0	3,919	257	0
Subtotal d	336	20	9	15,662	1,421	2
Total	942	97	3,159	39,713	255,947	2

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook and coho salmon roe.
c Chinook and summer chum salmon season 6/19 to 8/01.
d Fall chum salmon season 8/07 to 8/30.

Table 10. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 5, Yukon area, 1988. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
6/15-6/16	42	1	5	0	0	0
6/17-6/19	48	3	23	0	0	0
6/21-6/23	48	15	277	19	42	0
6/24-6/26	48	14	360	122	53	0
6/28-6/30	48	20	640	186	84	0
7/01-7/04	72	22	764	126	51	0
7/05-7/06 c	18	26	985	269	133	0
7/07-7/09	72	3	87	0	0	0
7/10-7/14 d	114	3	295	0	0	0
Subtotal e	510	28	3,436	722	363	0
8/18-8/19	24	15	0	6,591	0	0
8/20-8/21	24	16	0	7,626	0	0
9/09-9/14	110	2	0	2,772	0	8
Subtotal f	158	20	0	16,989	0	8
Total	668	35	3,436	17,711	363	8

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.
c Subdistricts 5-A, 5-B, and 5-C closed 6 July.
d Subdistrict 5-D closed 14 July.
e Chinook and summer chum salmon season 6/15 to 7/14.
f Fall chum salmon season 8/18 to 9/14.

Table 11. Commercial salmon and salmon roe sales and effort by fishing period, set gill nets and fishwheels combined, District 6, Yukon area, 1988. a

Period Dates	Hours Fished	No. of Fishermen	Chinook	Chum	Chum Roe b	Coho
7/01-7/03	42	1	0	62	0	0
7/04-7/06	42	5	0	203	12	0
7/08-7/10	42	15	105	1,578	170	0
7/11-7/13	42	22	90	3,582	94	0
7/15-7/17	42	21	38	3,876	216	0
7/18-7/20	42	25	30	5,855	108	0
7/22-7/24	42	25	168	5,065	109	0
7/25-7/27	42	24	153	4,518	231	0
7/29-7/31	42	24	83	3,619	151	0
8/01-8/03	42	23	39	2,767	149	0
8/05-8/07	42	22	31	2,252	124	0
8/08-8/10	42	20	16	2,552	163	0
8/12-8/14	42	14	3	1,962	64	0
8/15-8/17	42	14	6	2,238	55	0
Subtotal c	588	33	762	40,129	1,646	0
9/09-9/10	24	28	0	8,084	348	2,296
9/13-9/14	24	29	0	8,933	228	6,014
9/20-9/21	24	28	0	4,827	1,230	5,662
Subtotal d	72	32	0	21,844	1,806	13,972
Total Comm.	660	38	762	61,973	3,452	13,972
ADF&G TF e	-	-	0	26,988	0	13,295
Total Season Sales	-	-	762	88,961	3,452	27,267

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook and coho salmon roe.
c Chinook and summer chum salmon season 7/01 to 8/17.
d Fall chum salmon season 9/09 to 9/21.
e Fall chum and coho salmon sold as part of a new test fishing project.

Table 12. Commercial salmon and salmon roe sales by gear type and by statistical area, upper Yukon area, 1988. a,b

Statistical Area	Summer Season									Fall Season								
	Chinook c			Chum			Summer Chum Roe d			Fall Chum			Fall Chum Roe e			Coho		
	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal	GN	FW	Subtotal
334-41	0	19	19	845	18,225	19,070	39,598	190,678	230,276	0	0	0	0	0	0	0	0	0
334-42	659	940	1,599	180	4,412	4,592	639	21,127	21,766	2,254	7,903	10,157	0	703	703	0	2	2
334-43	657	884	1,541	105	284	389	21	2,463	2,484	866	4,639	5,505	0	718	718	0	0	0
Subtotal Dist. 4	1,316	1,843	3,159	1,130	22,921	24,051	40,258	214,268	254,526	3,120	12,542	15,662	0	1,421	1,421	0	2	2
334-51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
334-52	852	646	1,498	219	498	717	150	187	337	626	9,058	9,684	0	0	0	0	0	0
334-53	1,146	331	1,477	5	0	5	7	19	26	2,228	2,305	4,533	0	0	0	0	0	0
334-54	327	134	461	0	0	0	0	0	0	0	2,772	2,772	0	0	0	0	8	8
Subtotal Dist. 5	2,325	1,111	3,436	224	498	722	157	206	363	2,854	14,135	16,989	0	0	0	0	8	8
334-61	25	280	305	426	7,552	7,978	0	71	71	78	4,422	4,500	0	0	0	12	1,228	1,240
334-62	0	253	253	728	24,183	24,911	73	1,092	1,165	918	12,699	13,617	0	1,035	1,035	1,410	8,962	10,372
334-63	81	123	204	1,231	6,009	7,240	27	383	410	262	3,465	3,727	0	771	771	228	2,132	2,360
Subtotal Dist. 6	106	656	762	2,385	37,744	40,129	100	1,546	1,646	1,258	20,586	21,844	0	1,806	1,806	1,650	12,322	13,972
Total Upper Yukon Comm.	3,747	3,610	7,357	3,739	61,163	64,902	40,515	216,020	256,535	7,232	47,263	54,495	0	3,227	3,227	1,650	12,332	13,982
Dist. 6 TF f	-	-	-	-	-	-	-	-	-	-	26,998	26,998	-	0	0	-	13,295	13,295
Total Season Sales	3,747	3,610	7,357	3,739	61,163	64,902	40,515	216,020	256,535	7,232	74,261	81,493	0	3,227	3,227	1,650	25,627	27,277

a Roe sales expressed in pounds of unprocessed product.
b Gear codes: GN - set gillnet; FW - fishwheel.
c Includes an additional 9 chinook salmon taken during the fall season.
d May include small amounts of chinook salmon roe.
e May include small amounts of coho salmon roe.
f Salmon sold in District 6 as part of a new test fishing project.

Table 13. Yukon River drainage total estimated commercial related salmon catch by district and country, 1988.

		Summer Chum				Fall Chum			
			Roe Production				Roe Production		
District	Chinook	Sold in Round	Females a	Unsold Males	Total b	Sold in Round	Females c	Total d	Coho
1	57,109	648,198	0	0	648,198	45,529	0	45,529	36,435
2	35,188	425,172	0	0	425,172	31,861	0	31,861	34,776
3	1,767	13,965	0	0	13,965	2,090	0	2,090	1,419
Total Lower Yukon	94,064	1,087,335	0	0	1,087,335	79,480	0	79,480	72,630
4	3,159	24,051 e	283,753	182,270 f	490,074	15,662	1,421	17,083	2
5	3,436	722	405	g	1,127	16,989	0	16,989	8
6	762	40,129	1,835	g	41,964	48,832 h	1,806	50,638 h	27,267 i
Total Upper Yukon	7,357	64,902	285,993	182,270	533,165	81,483 h	3,227	84,710 h	27,277 i
Total Alaskan	101,421	1,152,237	285,993	182,270	1,620,500	160,963 h	3,227	164,190 h	99,907 i
Total Canadian	13,217	0	0	0	0	30,263	0	30,263	0
Grand Total	114,638	1,152,237	285,993	182,270	1,620,500	191,226 h	3,227	194,453 h	99,907 i

a Harvest of females estimated by dividing pounds of unprocessed roe (254,526 lbs District 4; 363 lbs District 5; 1,646 lbs District 6) by average roe weight per female calculated for District 4 (0.897 lbs).
b Totals may not be the same as those in Table 15, since many females stripped of roe and incidental males were reported as subsistence catches.
c Harvest of females estimated by dividing pounds of unprocessed roe (1,421 lbs District 4; 1,806 lbs District 6) by average roe weight per female (1.0 lb).
d All males assumed to have been sold in the round. Totals may not be the same as those in Table 15, since females stripped of roe were believed to be reported as subsistence catches.
e Chum salmon sold in the round in this district assumed to be all males.
f Estimate of number of males taken incidental to roe fishery which were not sold based on mean proportion of females observed at Stink Creek test fishery 1981-1985 (.579).
g Estimates not made since males assumed to have been sold or retained for subsistence.
h Includes 26,988 fall chum salmon sold in District 6 as part of a new test fishing project.
i Includes 13,295 coho salmon sold in District 6 as part of a new test fishing project.

Table 14. Yukon River drainage subsistence and personal use salmon catch data, 1988. a

Village	Survey Date	Fishing Households b	Dogs	Chinook	Summer Chum	Fall Chum	Coho	8" Nets	6" Nets	Fish Wheels
Sheldon Pt.	9/8	16	26	302	2,589	289	169	0	7	0
Alakanuk	9/2,9/6	63	166	738	6,992	1,194	634	5	32	0
Emmonak	9/9,9/12	53	104	1,786	10,528	1,792	1,578	5	17	0
Kotlik	9/7	56	191	1,112	8,825	2,200	2,008	3	29	0
Personal Use	permits	17	-	~~82~~ 67	~~905~~ 416	~~7~~ 75	0	-	-	0 *
Y-1 Subtotal		205	487	4,020	29,439	5,482	4,389	13	85	0
Mt. Village	9/21-22	72	210	740	9,248	1,880	1,314	12	45	0
Pitkas Pt.	9/20	14	85	367	2,384	622	1,015	1	8	0
St. Marys	9/15-16	45	157	1,011	8,117	1,911	2,132	7	30	0
Pilot Station	9/14-15	42	133	674	4,242	1,372	876	6	25	0
Marshall	9/27	38	304	1,031	4,796	2,815	1,767	9	23	0
Y-2 Subtotal		211	889	3,823	28,787	8,600	7,104	35	131	0
Russian Mission	9/28	31	162	1,850	2,794	1,151	604	8	16	0
Holy Cross	10/11-12	28	69	2,593	3,036	596	935	16	3	0
Y-3 Subtotal		59	231	4,443	5,830	1,747	1,539	24	19	0
Lower Yukon Total c		475	1,607	12,286	64,056	15,829	13,032	72	235	0
Anvik	10/12-13	15	73	211	12,607	136	97	4	7	2
Shageluk d	10/25-26	18	98	104	8,779	0	128	2	12	0
Grayling	10/13-14	26	243	1,571	22,634	1,760	692	8	10	5
Kaltag	9/21-22,25	32	155	1,168	3,592	2,293	0	8	13	9
Nulato	9/22-23	40	113	1,986	10,201	1,673	234	7	9	6
Koyukuk	9/24	18	79	711	284	587	10	5	9	3
Galena	10/5-8	64	162	1,982	7,413	4,308	1,029	16	11	14
Ruby	10/8	30	151	1,402	4,010	5,171	2,169	5	5	7
Y-4 Subtotal		243	1,074	9,135	69,520 e	15,928	4,359	55	76	46
Tanana f	10/12-13	60	269	3,537	13,972	55,998	16,922	8	8	11
Rampart	10/12	13	10	3,145	3,383	3,600	842	5	0	1
Fbks. Pers-Use g	permits	39		1435 ~~2,044~~	~~[illegible]~~	~~[illegible]~~	103 ~~0~~	-	-	-
Stevens Village	10/14	18	101	2,845	865	1,451	604	4	4	3
Beaver	10/12	13	47	940	214	96	164	4	1	1
Ft. Yukon h	10/26-31	52	264	2,245	7,717	2,766	370	7	12	12
Circle/Central i	10/19-20	22	60	2,034	871	4,396	41	2	4	4
Eagle j	11/2-3	51	148	2,333	1,273	14,800	11	11	7	5
Y-5 Subtotal		268	899	19,123	29,622	~~85,760~~ 83,107	18,954	41	36	37
Main River Totals		986	3,580	40,544	163,198	117,517	36,345	168	347	83

-Continued-

* Changed permits use to reported ... Not Est. in 1992

pers. use 1,567

pers. use = 1,762 Not expanded Reported

1,435 from pers. use Reported

Table 14. Yukon River drainage subsistence and personal use catch data, 1988 (Continued).

Village	Survey Date	Fishing Households b	Dogs	Chinook	Summer Chum	Fall Chum	Coho	8" Nets	6" Nets	Fish Wheels
Manley f	10/24-25	18	178	572	3,731	6,899	2,103	1	2	3
Minto	10/27-28	19	219	466	947	2,615	2,729	0	1	5
Nenana k	10/11-12	79	190	3,846	5,654	26,889	25,369	0	3	25
Fairbanks l,m	Pers-use Permit	114	-	~~957~~	~~1,745~~	~~2,250~~	~~1,300~~	-	-	-
Y-6 Subtotal		230	587	5,441	12,047	38,633	31,509	1	6	33
Huslia	10/3	25	202	89	14,895	1,697	201	3	12	2
Hughes	10/5	15	47	29	2,445	311	104	2	9	0
Allakaket n	9/29	25	207	366	8,524	443	178	2	18	0
Koyukuk R. Subtotal		65	456	484	25,864	2,451	483	7	39	2
Venetie	10/24-25	8	73	121	701	34	0	1	5	0
Chalkyitsik h	10/22	15	83	0	327	1,068	801	0	4	1
Subt Chandalar/Black Rivers		23	156	121	1,028	1,102	801	1	9	1
Subtotal Upper Yukon (Alaska)		829	3,172	34,304	138,081	143,874	56,106	105	166	119
Yukon River Drainage (Alaska) Total		1,304	4,779	46,590	202,137	159,703	69,138	177	401	119
Old Crow o		p	p	100	p	1,071	p	p	p	p
Yukon River Mainstem Canada o		p	p	7,460	p	2,231	p	p	p	p
Yukon Territory o Totals		p	p	7,560	p	3,302	p	p	p	p
Grand Total Yukon River Drainage		1,304	4,779	54,150	202,137	163,005	69,138	177	401	119

a Subsistence catch data collected and expanded by Subsistence Division (see text for methodology); personal use data collected by Commercial Fisheries Division. Number of dogs and gear data not expanded.
b Estimated number of households that fished.
c Does not include Hooper Bay and Scammon Bay harvest of 1,588 chinook, 31,230 summer chum, 2,262 fall chum and 1,849 coho salmon.
d Shageluk harvest data from households fishing in mainstem Yukon River and Innoko River.
e Does not include a reported 106,801 fish taken during commercial roe fishery that were used for dog food or sold for dog food.
f Catches by two Manley residents that fished near Tanana village included with Tanana.
g Data from fishermen who fished between Hess Creek and Dall River (Fairbanks Fish Camp). A total of 58 permits issued of which 39 reported catches.
h One fishermen from Chalkyitsik fished near Fort Yukon; catches included with Fort Yukon.
i Includes Circle and vicinity, and Central (15 subsistence permits returned).
j Includes Eagle and vicinity, and Eagle Village (35 subsistence permits returned). A total of 33 subsistence permits from Circle to Eagle reported catches.
k Includes catches from Kantishna River and Healy.
l Data from fishermen (Fairbanks, North Pole and Salcha combined) that fished on the Tanana River between the mouth of Wood River and the mouth of Salcha River.
m A total of 210 permits issued of which 114 reported catches.
n Alatna combined with Allakaket.
o Indian Food Fish and Domestic catch data from Department of Fisheries & Oceans, Whitehorse, YT.
p Data not available.

Table 15. Yukon River drainage total utilization of salmon by district and country, 1988.

District	Fishery	Chinook	Summer Chum	Fall Chum	Coho
1	Commercial	57,109	648,198	45,529	36,435
	Subsistence	3,938	28,934	5,475	4,389
	Personal Use	82	505	7	0
	Total	61,129	677,637	51,011	40,824
2	Commercial	35,188	425,172	31,861	34,776
	Subsistence	3,823	28,787	8,600	7,104
	Total	39,011	453,959	40,461	41,880
3	Commercial	1,767	13,965	2,090	1,419
	Subsistence	4,443	5,830	1,747	1,539
	Total	6,210	19,795	3,837	2,958
Total Lower Yukon	Commercial	94,064	1,087,335	79,480	72,630
	Subsistence	12,204	63,551	15,822	13,032
	Personal Use	82	505	7	0
	Total	106,350	1,151,391	95,309	85,662
4	Commercial	3,159	383,273 a	15,662 d	2
	Subsistence b	9,619	202,185	18,379	4,842
	Total	12,778	585,458	34,041	4,844
5	Commercial	3,436	722 d	16,989	8
	Subsistence c	17,200	29,323	84,209	19,755
	Personal Use	2,044	1,327	2,653	0
	Total	22,680	31,372	103,851	19,763
6	Commercial	762	40,129 d	48,832 d,e	27,267 f
	Subsistence	4,884	10,332	36,403	30,201
	Personal Use	557	1,715	2,230	1,308
	Total	6,203	52,176	87,465	58,776
Total Upper Yukon	Commercial	7,357	424,124	81,483	27,277
	Subsistence	31,703	241,840	138,991	54,798
	Personal Use	2,601	3,042	4,883	1,308
	Total	41,661	669,006	225,357	83,383
Total Yukon Area (Alaska)	Commercial	101,421	1,511,459	160,963	99,907
	Subsistence	43,907	305,391	154,813	67,830
	Personal Use	2,683	3,547	4,890	1,308
	Total	148,011	1,820,397	320,666	169,045
Total Canada g	Commercial	13,217	0	30,263	0
	Subsistence h	7,560	0	3,302	0
	Total	20,777	0	33,565	0
Grand Total	Commercial	114,638	1,511,459	191,226	99,907
	Subsistence	51,467	305,391	158,115	67,830
	Personal Use	2,683	3,547	4,890	1,308
	Total	168,788	1,820,397	354,231	169,045

a Total estimated commercial related harvest was 490,074 summer chum salmon (Table 13) of which a reported 106,801 fish were used for subsistence purposes. These fish were added to the District 4 subsistence harvest (Table 14).
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Harvest of females for commercial roe sales believed to be reported as subsistence.
e Includes 26,988 fall chum salmon sold as part of a new test fishing project.
f Includes 13,295 coho salmon sold as part of a new test fishing project.
g Data from Department of Fisheries and Oceans, Whitehorse, YT.
h Combined Indian Food and Domestic fisheries.

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1988. a

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Andreafsky River						
East Fork (Tower Count)	6/21-7/25		1,339	68,937	--	--
East Fork (Aerial)	7/16,9/13	Good,Good	(1,020)	(43,056)	--	1,913
West Fork (Aerial)	7/16,9/13	Fair,Fair	1,448	45,432	--	830
	Subtotal		2,787	114,369	--	2,743
Atchuelinguk River (Chulinak R)	7/16	Fair	915	47,174	--	176
Yukon River (Pilot Station)						
Main River Sonar b,c,w	6/2-9/14		(80,834)	(1,875,880)	(506,993)	(263,887)
Innoko River						
Reindeer Lake and River	7/29	Poor	0	21	--	--
Anvik River						
Aerial Counts						
Mainstem River	7/16,9/7	Fair,Fair	1,637	(120,450)	--	1,012
Beaver Creek	7/16	Fair	26	(5,700)	--	--
Canyon Creek	7/16	Fair	10	(5,800)	--	--
Otter Creek	7/16,9/7	Fair,Fair	108	(31,140)	--	76
Swift River	7/16,9/7	Fair,Fair	17	(7,750)	--	115
Yellow River	7/16	Fair	7	(1,510)	--	--
Sonar Count d	6/21-7/27		--	1,125,449	--	--
	Subtotal		1,805	1,125,449	--	1,203
Rodo River	7/14	Fair	282	13,872	--	--
Nulato River						
Below Forks	7/14	Good	72	8,565	--	--
South Fork	7/14	Good	714	15,132	--	--
North Fork	7/14	Good	989	18,386	--	--
	Subtotal		1,775	42,083	--	--
Koyukuk River Drainage						
Gisasa River	7/14,7/29	Good,Good	797	9,284	--	--
Dakli River	7/15	Good	0	4,985	--	--
Wheeler Creek	7/15	Good	0	6,793	--	--
	Subtotal		0	11,778	--	--
Hogatza River						
Caribou Creek	7/15	Good	0	4,020	--	--
Clear Creek	7/15	Good	0	2,870	--	--
	Subtotal		0	6,890	--	--
Henshaw Creek	7/28	Good-Poor	180	1,106	--	--

-Continued-

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1988 (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
South Fork Koyukuk River	7/28,10/8 z	Good,Poor	260	437	250 z	--
Jim River	7/28,10/8 z	Good,Poor	159	291	30 z	--
	Subtotal		419	728	280	--
Total Koyukuk River			1,396	29,786	280	--
Melozitna River						
Melozi Hot Springs Creek	7/15	Fair	0	1,503	--	--
Tozitna River	7/23	Good	116	2,983	--	--
Lower Tanana River Drainage						
Kantishna River Drainage						
Toklat River						
Barton Creek	10/22	Fair	--	--	--	437
Floodplain vic Rdhse f	10/19-22	Good	--	--	10,786	36
Floodplain vic Rdhse (aerial)	10/11	Fair	--	--	(14,225) y	0
Geiger Creek g	10/20	Good	--	--	1,952	159
Sushana River g	10/21	Good	--	--	25	1
Population Estimate for upper Toklat area h			--	--	(13,324)	--
	Subtotal		--	--	12,763	633
Nenana River Drainage						
Seventeen Mile Slough	9/7	Good	--	--	200	--
Lost Slough	10/11	Fair	--	--	--	348
Julius Creek						
Clear Creek z	7/9-29		200 z	--	--	--
Wood Creek Weir Counts i	9/19-10/14		--	--	3,991 u	2,046 v
	Subtotal		200	--	4,191	2,394
Chena River (Aerial)	7/20,7/27	Fair-Poor	1,966	432	--	--
Population Estimate j			(N.Y.A.)	--	--	--
	Subtotal		1,966	432	--	--
Salcha River (Aerial)	7/27,8/1	Good,Poor	2,761	2,889	--	--
Population Estimate c,j,k			(4,562)	--	--	--
Foot Survey dwnstr bridge	10/23		--	--	10	--
	Subtotal		2,761	2,889	10	--
Total Lower Tanana River			4,927	3,321	16,964	3,027
Upper Tanana River Drainage						
Vicinity Benchmark 735 Slough	10/21	Good	--	--	20	--
Mainstem Tanana sloughs between Little Delta R and vicinity Andersen Slough	10/21	Good	--	--	550	--
Vicinity Andersen Slough	10/21	Good	--	--	315	--
Southbank Tanana	10/21	Fair	--	--	7,000	--

-Continued-

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1988 (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Delta River						
Aerial Survey	10/21	Good	--	--	(5,560)	--
Foot Survey	10/31	Good	--	--	16,591	17
Population Estimate h			--	--	(18,024)	--
Bluff Cabin Slough	10/21	Good	--	--	4,481	--
Bluff Cabin Spring	10/21	Good	--	--	--	40
Slough across from Bluff C.Sl.	10/28	Good	--	--	33	--
Clearwater Lake Outlet Slough	10/21	Good	--	--	2,312	--
Clearwater Lake and Outlet n,k	10/28	Good	--	--	--	825
Delta Clearwater River n,k	10/27-28	Good-Fair	--	--	75	21,600
Onemile Slough	10/21	Fair	--	--	1,520	--
Vicinity Pearse Slough	10/21	Good	--	--	1,715	--
Billy Creek Slough	10/28	Poor	--	--	151	--
Total Upper Tanana River			--	--	34,763	22,482
Total Tanana River			4,927	3,321	51,727	25,509
Bear Creek (foot)	7/21		--	67	--	--
Chandalar River						
Sonar Estimate c,d,e	8/11-9/24		--	--	33,619 c	--
Porcupine River Drainage						
Sheenjek River						
Sonar Estimate c,d	8/25-9/24		--	--	38,800 c	--
Coleen River z	9/12		--	--	28	--
Fishing Branch River (weir) c,q			--	--	23,597 c	--
Total Porcupine River			--	--	62,425	--
Nation River e,n	8/1-4,9/15		3	2	--	--
Tatonduk River e,n	8/19		--	4	--	--
Total Alaskan Portion of Drainage			14,006	1,380,634	124,454 t	29,631

-Continued-

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1988 (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Yukon Territory Streams						
White River						
Donjek River						
Kluane River q	10/19	Fair	--	--	6,950	--
Tincup Creek q	8/18	Good	204	--	--	--
Koidern River q	10/19	Good	--	--	0	--
	Subtotal		204	--	6,950	--
Pelly River						
Ross River q	8/22	Fair	202	--	--	--
Ross River	8/18	Poor	(194)	--	--	--
Lewis Lake Outlet	8/18	Poor	40	--	--	--
Hoole River	8/18	Fair	132	--	--	--
	Subtotal		374	--	--	--
Tatchun Creek g	8/30		130	--	--	--
Little Salmon River						
ADF&G Aerial Survey	8/17	Fair	(318)	--	--	--
DFO Aerial Survey	8/23	Fair	368	--	--	--
Big Salmon River						
Big Salmon Lake to Scurvy Cr	8/16	Good-Fair	111	--	--	--
Scurvy Cr to Moose Cr	8/16	Good	300	--	--	--
Moose Cr to DFO weir	8/16	Good	208	--	--	--
DFO weir count	8/9-30	Incomplete	(344) m	--	--	--
DFO weir to Bat Cr	8/16	Good	27	--	--	--
Bat Cr to Souch Cr	8/16	Good	119	--	--	--
	Subtotal		765	--	--	--
Teslin River Drainage						
Nisutlin River	8/15-16	Good-Fair	482	--	--	--
Wolf River	8/17	Fair-Good	121	--	--	--
Swift River	8/19	Poor	29	--	--	--
Morley River	8/19	Poor	17	--	--	--
Jennings River	8/19	Poor	14	--	--	--
	Subtotal		663	--	--	--
Takhihi River q	8/20	Good	225	--	--	--
Ibex River q	8/29	?	3	--	--	--
	Subtotal		228	--	--	--

-Continued-

Table 16. Salmon spawning escapement estimates obtained by aerial surveys in the Yukon River drainage, 1988 (Continued).

Stream (drainage)	Date	Survey Rating	Chinook	Summer Chums	Fall Chums	Coho
Whitehorse Fishway Counts q,r	7/31-9/3		405	--	--	--
Mainstem Yukon River						
Tatchun Creek to Ft Selkirk q	10/18	Fair	--	--	1,550	--
Population Estimates c,j,q,s			(43,936)c	--	(68,082)c	--
Subtotal			--	--	1,550	--
Total Yukon Territory			3,137	--	32,097 t	--
Yukon River Drainage Totals			17,143	1,380,634	156,551	29,631

a Only peak estimates listed; carcass counts included. Data in parentheses not included in totals or subtotals.
b Biosonics sonar estimate.
c Preliminary.
d Bendix side scan sonar estimate.
e U.S. Fish and Wildlife Service estimate.
f Combined foot and aerial estimate.
g Foot survey.
h Population estimate based upon replicate foot surveys and streamlife data.
i F.R.E.D. Division estimate.
j Population estimate based upon mark and recapture study.
k Sport Fish Division estimate.
m Incomplete due to high water. DFO estimated passage of 1,200 to 1,400 chinook.
n Boat survey.
q Canadian Department of Fisheries and Oceans (DFO) estimate.
r Includes 134 (74 females, 60 males) taken for hatchery brood stock. Of the remaining 271 which escaped 50 were hatchery-marked jack males. Thus, less than 221 chinooks passed were wild stock.
s Canadian estimates for Yukon Territory streams excluding the Fishing Branch River. Commercial and subsistence catches have not been removed from these estimates.
t Total for Alaskan portion of drainage does not include Fishing Branch River. Total for Yukon Territory includes Fishing Branch River.
u A total of 300 chum salmon were artificially spawned.
v A total of 362 coho salmon were artificially spawned for the Clear Hatchery. A total of 150 of the coho salmon returning to the weir were hatchery marked fish. All of these were included in the egg takes.
w An estimated 536,312 pink salmon were also estimated passing the sonar site.
y Aerial estimate was less reliable than combined aerial/foot surveys conducted October 19-22.
z Documentation by public.
N.Y.A. - Not Yet Available

Table 17. Yukon River (Alaska) salmon escapement objectives for selected species and streams, 1988.

Stream	Escapement Objectives a			
		Summer Chum		
	Chinook	Minimum	Optimum	Fall Chum
Andreafsky River				
East Fork	1,600	76,000	109,000	
West Fork	1,000	62,000	116,000	
Anvik River				
Mainstem				
Yellow River to McDonald Cr	500			
Goblet Cr to McDonald Cr		209,000	356,000	
Sonar b			487,000	
Nulato River				
North Fork	500	37,000	53,000	
South Fork	500			
Hogatza River				
Clear Creek		5,000	8,000	
Caribou Creek		5,000	9,000	
Gisasa River	650			
Chena River				
Mainstem from Flood Control Dam to Middle Fork	1,700			
Salcha River	3,500	3,500		
Sheenjek River				62,000 c
Toklat River				33,000 c
Delta River				11,000 c

a Escapement objectives in numbers of fish are preliminary and are subject to change as additional data becomes available. Unless otherwise indicated, escapement objectives are based on aerial survey index estimates which do not represent total escapement, but do reflect annual spawner abundance trends when using standard survey methods under acceptable survey conditions.

b Optimum number calculated from escapement-return relationships.

c Total season escapement objective (expanded from inseason point estimates).

Table 18. Estimates of illegal salmon and salmon roe sales and related data, Upper Yukon area, 1987.

Chinook Salmon			
	District 5 a	District 6 b	Total
Number of Fish c	653	2,136	2,789
Fall Chum Salmon			
	District 5 a	District 6 b	Total
Pounds of Processed Fish d	24,000	227,000	251,000
Estimated Pounds of Fish Round Weight e	30,720	290,560	321,280
Estimated Numbers of Fish f	4,042	38,232	42,274
Fall Chum Salmon and Coho Salmon Roe			
	District 5 a	District 6 b	Total
Pounds of Processed Roe g			
Fall Chum Roe	43,850 h	49,653 i	93,503
Coho Roe		17,445 i	17,445
	43,850	67,098	110,948
Estimated Pounds of Raw Product j			
Fall Chum Roe	47,884 k	59,584	107,468
Coho Roe	4,736 k	20,934	25,670
	52,620	80,518	133,138
Estimated Equivalent Catch in Numbers of Fish l			
Fall Chum	95,768	119,168	214,936
Coho	11,840	52,335	64,175
	107,608	171,503	279,111
Revised Total Utilization m			
Fall Chum	157,085	127,903	284,988
Coho	11,900	55,471	67,371

a Yukon River between District 4/5 boundary and Dalton Highway bridge where illegal sales are known to have occured. Includes an unknown volume of fall chum and fall chum salmon roe from the upstream portion of District 4.
b Tanana River where illegal sales of chinook and fall chum salmon, and fall chum and coho salmon roe are known to have occured at Manley Hot Springs and Nenana.
c Illegal sales reported in numbers of fish by Division of Fish and Wildlife Protection. Poundages not available.
d Illegal sales reported in pounds of processed fish (dressed, heads off) by Division of Fish and Wildlife Protection.
e Pounds of processed fish expanded by a factor of 1.28 to account for processing weight loss.
f Estimated round weight of fish divided by 7.6 pounds, the mean weight of fall chum salmon in the 1982 - 1986 upper Yukon commercial catch.
g Illegal sales of fall chum and coho salmon roe in pounds of processed product.
h Species composition information not reported.
i Species composition for District 6 based on seized records from one processor indicating 74% and 26% of illegally sold roe was from fall chum and coho salmon, respectively.
j Pounds of processed product expanded by factor of 1.2 to account for egg breakage, dehydration and other weight loss associated with processing.
k Estimated species composition of raw product established by using species composition of reported subsistence harvest in the Tanana village, Rampart, and Dalton Highway bridge area of District 5.
l Divided pounds of unprocessed roe by 1.0 for fall chum roe and by 0.8 for coho salmon roe (estimated mean roe weight per female) to obtain numbers of females by species, and then multiplied by 2.0 (assume 1:1 sex ratio).
m Totals derived by substituting reported subsistence catch in areas where illegal sales occurred with estimated equivalent catch and adding to subsistence catches reported for remainder of districts (61,317 fall chum and 60 coho salmon in District 5, and 8,735 fall chum and 3,136 coho salmon in District 6).

Table 19. Commercial herring catch and effort data by fishing period, Cape Romanzof District, 1988.

Date	Hours Fished	No. of Fishermen	No. of Landings	Period Catch (st)			Roe %
				Bait	Sac Roe	Total	
24-25 May	6	111	245	0.4	492.1	492.5	9.13
26-May	5	111	282	4.2	622.8	627.0	9.11
Total	11	113	527	4.6	1,114.8	1,119.4	9.12

Appendix Table 1. Alaskan and Canadian total utilization of Yukon River salmon, 1903-1988. a

Year	Alaska			Canada			Total		
	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total	Chinook	Other Salmon	Total
1903						4,666			4,666
1904									
1905									
1906									
1907									
1908						7,000			7,000
1909						9,238			9,238
1910									
1911									
1912									
1913						12,133			12,133
1914						12,573			12,573
1915						10,466			10,466
1916						9,566			9,566
1917									
1918	12,239	1,500,065	1,512,304			7,066	12,239	1,500,065	1,519,370
1919	104,822	738,790	843,612			1,800	104,822	738,790	845,412
1920	78,467	1,015,655	1,094,122			12,000	78,467	1,015,655	1,106,122
1921	69,646	112,098	181,744			10,840	69,646	112,098	192,584
1922	31,825	330,000	361,825			2,420	31,825	330,000	364,245
1923	30,893	435,000	465,893			1,833	30,893	435,000	467,726
1924	27,375	1,130,000	1,157,375			4,560	27,375	1,130,000	1,161,935
1925	15,000	259,000	274,000			3,900	15,000	259,000	277,900
1926	20,500	555,000	575,500			4,373	20,500	555,000	579,873
1927		520,000	520,000			5,366		520,000	525,366
1928		670,000	670,000			5,733		670,000	675,733
1929		537,000	537,000			5,226		537,000	542,226
1930		633,000	633,000			3,660		633,000	636,660
1931	26,693	565,000	591,693			3,473	26,693	565,000	595,166
1932	27,899	1,092,000	1,119,899			4,200	27,899	1,092,000	1,124,099
1933	28,779	603,000	631,779			3,333	28,779	603,000	635,112
1934	23,365	474,000	497,365			2,000	23,365	474,000	499,365
1935	27,665	537,000	564,665			3,466	27,665	537,000	568,131
1936	43,713	560,000	603,713			3,400	43,713	560,000	607,113
1937	12,154	346,000	358,154			3,746	12,154	346,000	361,900
1938	32,971	340,450	373,421			860	32,971	340,450	374,281
1939	28,037	327,650	355,687			720	28,037	327,650	356,407
1940	32,453	1,029,000	1,061,453			1,153	32,453	1,029,000	1,062,606
1941	47,608	438,000	485,608			2,806	47,608	438,000	488,414
1942	22,487	197,000	219,487			713	22,487	197,000	220,200
1943	27,650	200,000	227,650			609	27,650	200,000	228,259
1944	14,232		14,232			986	14,232		15,218
1945	19,727		19,727			1,333	19,727		21,060
1946	22,782		22,782			353	22,782		23,135
1947	54,026		54,026			120	54,026		54,146
1948	33,842		33,842				33,842		33,842
1949	36,379		36,379				36,379		36,379
1950	41,808		41,808				41,808		41,808
1951	56,278		56,278				56,278		56,278
1952	38,637	10,868	49,505				38,637	10,868	49,505
1953	58,859	385,977	444,836				58,859	385,977	444,836
1954	64,545	14,375	78,920				64,545	14,375	78,920
1955	55,925		55,925				55,925		55,925
1956	62,208	10,743	72,951				62,208	10,743	72,951
1957	63,623		63,623				63,623		63,623
1958	75,625	337,500	413,125	11,000	1,500	12,500	86,625	339,000	425,625
1959	78,370		78,370	8,434	3,098	11,532	86,804	3,098	89,902
1960	67,597		67,597	9,653	15,608	25,261	77,250	15,608	92,858
1961	141,152	452,521	593,673	13,246	9,076	22,322	154,398	461,597	615,995
1962	105,844	425,277	531,121	13,937	9,436	23,373	119,781	434,713	554,494
1963	141,910	401,700	543,610	10,077	27,696	37,773	151,987	429,396	581,383
1964	109,818	492,233	602,051	7,408	12,187	19,595	117,226	504,420	621,646
1965	134,706	472,798	607,504	5,380	11,789	17,169	140,086	484,587	624,673
1966	104,887	296,310	401,197	4,452	13,192	17,644	109,339	309,502	418,841
1967	146,104	335,436	481,540	5,150	16,961	22,111	151,254	352,397	503,651
1968	118,632	259,185	377,817	5,042	11,633	16,675	123,674	270,818	394,492
1969	105,027	416,623	521,650	2,624	7,776	10,400	107,651	424,399	532,050
1970	93,019	582,049	675,068	4,663	3,711	8,374	97,682	585,760	683,442
1971	136,191	530,537	666,728	6,447	16,911	23,358	142,638	547,448	690,086
1972	113,098	454,085	567,183	5,729	7,532	13,261	118,827	461,617	580,444
1973	99,670	769,023	868,693	4,522	10,135	14,657	104,192	779,158	883,350
1974	118,053	1,218,032	1,336,085	5,631	11,646	17,277	123,684	1,229,678	1,353,362
1975	76,883	1,286,437	1,363,320	6,000	20,600	26,600	82,883	1,307,037	1,389,920
1976	105,582	1,021,708	1,127,290	5,025	5,200	10,225	110,607	1,026,908	1,137,515
1977	114,338	1,090,330	1,204,668	7,527	12,479	20,006	121,865	1,102,809	1,224,674
1978	129,465	1,631,479	1,760,944	5,881	9,566	15,447	135,346	1,641,045	1,776,391
1979	158,678	1,631,072	1,789,750	10,375	22,084	32,459	169,053	1,653,156	1,822,209
1980	196,709	1,783,274	1,979,983	22,546	22,218	44,764	219,255	1,805,492	2,024,747
1981	187,708	2,097,214	2,284,922	17,809	22,281	40,090	205,517	2,119,495	2,325,012
1982	151,802	1,269,392	1,421,194	16,908	16,091	32,999	168,710	1,285,483	1,454,193
1983	197,388	1,677,390	1,874,778	18,652	29,490	48,142	216,040	1,706,880	1,922,920
1984	162,232	1,554,314	1,716,546	16,495	29,267	45,762	178,727	1,583,581	1,762,308
1985	185,959	1,655,909	1,841,868	19,001	41,265	60,266	204,960	1,697,174	1,902,134
1986	145,252	1,756,395	1,901,647	20,064	14,536	34,600	165,316	1,770,931	1,936,247
1987 b	187,884	1,244,038	1,431,922	17,364	44,480	61,844	205,248	1,288,518	1,493,766
1988	148,011	2,310,108	2,458,119	20,777	33,565	54,342	168,788	2,343,673	2,512,461

a Commercial and subsistence harvest combined in numbers of fish, including estimates of chums taken incidental to roe sales in District 4. See ADF&G 1985 Yukon Area Annual Management Report for data sources and methods of catch estimation used for some years.
b Includes estimates of catches involved in illegal salmon and salmon roe sales.

Appendix Table 2. Commercial chinook salmon sales by district and country, Yukon River drainage, 1961-1988. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total	Canada Total	Grand Total
	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal			
1961	84,466	29,026	4,368	117,860	-	-	-	1,804	119,664	3,446	123,110
1962	67,099	22,224	4,687	94,010	-	-	-	724	94,734	4,037	98,771
1963	85,004	24,221	7,020	116,245	-	-	-	803	117,048	2,283	119,331
1964	67,555	20,246	4,705	92,506	-	-	-	1,081	93,587	3,208	96,795
1965	89,268	23,763	3,204	116,235	-	-	-	1,863	118,098	2,265	120,363
1966	70,788	16,927	3,612	91,327	-	-	-	1,988	93,315	1,942	95,257
1967	104,350	20,239	3,618	128,207	-	-	-	1,449	129,656	2,187	131,843
1968	79,465	21,392	4,543	105,400	-	-	-	1,126	106,526	2,212	108,738
1969	71,688	14,756	3,595	90,039	-	-	-	988	91,027	1,640	92,667
1970	56,648	17,141	3,705	77,494	-	-	-	1,651	79,145	2,611	81,756
1971	86,042	19,226	3,490	108,758	-	-	-	1,749	110,507	3,178	113,685
1972	70,052	17,855	3,841	91,748	-	-	-	1,092	92,840	1,769	94,609
1973	56,981	13,859	3,204	74,044	-	-	-	1,309	75,353	2,199	77,552
1974	71,840	17,948	3,480	93,268	685	2,663	1,473	4,821	98,089	1,808	99,897
1975	44,585	11,315	4,177	60,077	389	2,872	500	3,761	63,838	3,000	66,838
1976	62,410	16,556	4,148	83,114	409	3,151	1,102	4,662	87,776	3,500	91,276
1977	69,915	16,722	3,965	90,602	985	4,162	1,008	6,155	96,757	4,720	101,477
1978	59,006	32,924	2,916	94,846	608	3,079	635	4,322	99,168	2,975	102,143
1979	75,007	41,498	5,018	121,523	1,989	3,389	772	6,150	127,673	6,175	133,848
1980	90,382	50,004	5,240	145,626	1,521	4,891	1,947	8,359	153,985	9,500	163,485
1981	99,506	45,781	4,023	149,310	1,347	6,374	987	8,708	158,018	8,593	166,611
1982	74,450	39,132	2,609	116,191	1,087	5,385	981	7,453	123,644	8,640	132,284
1983	95,457	43,229	4,106	142,792	601	3,606	911	5,118	147,910	13,027	160,937
1984	74,671	36,697	3,039	114,407	961	3,669	867	5,497	119,904	9,885	129,789
1985	90,011	48,365	2,588	140,964	664	3,418	1,142	5,224	146,188	12,573	158,761
1986	53,035	41,849	901	95,785	502	2,733	950	4,185	99,970	10,797	110,767
1987	76,643	47,458	2,039	126,140	1,524	3,758 b	3,338 c	8,620	134,760	10,864	145,624
1988	57,109	35,188	1,767	94,064	3,159	3,436	762	7,357	101,421	13,217	114,638
5 Yr Ave 1978-82	79,670	41,868	3,961	125,499	1,310	4,624	1,064	6,998	132,498	7,177	139,674
5 Yr Ave 1983-87	77,963	43,520	2,535	124,018	850	3,437	1,442	5,729	129,746	11,429	141,176

a Sales reported in numbers of fish sold in the round.

b Includes illegal sales of 653 chinook salmon.

c Includes illegal sales of 2,136 chinook salmon.

Appendix Table 3. Commercial summer chum salmon sales by district, Yukon River drainage, 1961-1988. a

	Lower Yukon Area				Upper Yukon Area								Alaska Total	
					Dist. 4		Dist. 5		Dist. 6		Subtotal			
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers		Roe b	Numbers
1961	-	-	-	0	-	-	-	-	-	-	0		0	0
1962	-	-	-	0	-	-	-	-	-	-	0		0	0
1963	-	-	-	0	-	-	-	-	-	-	0		0	0
1964	-	-	-	0	-	-	-	-	-	-	0		0	0
1965	-	-	-	0	-	-	-	-	-	-	0		0	0
1966	-	-	-	0	-	-	-	-	-	-	0		0	0
1967	9,453	1,425	57	10,935	-	-	-	-	-	-	0		0	10,935
1968	12,995	1,407	68	14,470	-	-	-	-	-	-	0		0	14,470
1969	56,886	5,080	-	61,966	-	-	-	-	-	-	0		0	61,966
1970	117,357	19,649	-	137,006	-	-	-	-	-	-	0		0	137,006
1971	93,928	6,112	50	100,090	-	-	-	-	-	-	0		0	100,090
1972	114,234	20,907	527	135,668	-	-	-	-	-	-	0		0	135,668
1973	221,644	63,402	463	285,509	-	-	-	-	-	-	0		0	285,509
1974	466,004	74,152	1,721	541,877	27,866	-	6,831	-	13,318	-	48,015		0	589,892
1975	418,323	99,139	-	517,462	165,054	-	12,997	-	14,782	-	192,833		0	710,295
1976	273,204	99,190	9,802	382,196	211,307	-	774	-	6,617	-	218,698		0	600,894
1977	250,652	105,679	3,412	359,743	169,541	-	1,274	-	4,317	-	175,132		0	534,875
1978	393,785	227,548	27,003	648,336	364,184	16,920	4,892	605	34,814	8,236	403,890		25,761	1,052,226
1979	369,934	172,838	40,015	582,787	169,430	35,317	8,608	1,009	18,491	3,891	196,529		40,217	779,316
1980	391,252	308,704	44,782	744,738	147,560	135,824	456	-	35,855	3,282	183,871		139,106	928,609
1981	507,158	351,878	54,471	913,507	59,718	187,032	1,236	49	32,477	1,987	93,431		189,068	1,006,938
1982	249,516	182,344	4,086	435,946	3,647	151,281	213	21	21,597	1,517	25,457		152,819	461,403
1983	451,164	248,092	14,600	713,856	6,672	148,125	42	1,856	24,309	18	31,023		149,999	744,879
1984	292,676	236,931	1,087	530,694	1,009	166,842	645	47	56,249	335	57,903		167,224	588,597
1985	247,486	188,099	1,792	437,377	12,007	247,085	700	-	66,913	1,540	79,620		248,625	516,997
1986	381,127	288,427	442	669,996	300	269,545	690	-	50,483	2,146	51,473		271,691	721,469
1987	222,898	174,876	3,501	401,275	29,991	121,474	362	44	10,610	450	40,963		121,968	442,238
1988	648,198	425,172	13,965	1,087,335	24,051	254,526	722	363	40,129	1,646	64,902		256,535	1,152,237
5 Yr Ave 1978-82	382,329	248,662	34,071	665,063	148,908	105,275	3,081	337	28,647	3,783	180,636		109,394	845,698
5 Yr Ave 1983-87	319,070	227,285	4,284	550,640	9,996	190,614	488	389	41,713	898	52,196		191,901	602,836

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of chinook salmon roe.

Appendix Table 4. Commercial fall chum salmon sales by district and country, Yukon River drainage, 1961-1988. a

	Lower Yukon Area				Upper Yukon Area										
					Dist. 4		Dist. 5		Dist. 6		Subtotal	Total			
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Roe b	Numbers	Canada Total	Grand Total
1961	42,461	-	-	42,461	-	-	-	-	-	-	0	0	42,461	3,276	45,737
1962	53,116	-	-	53,116	-	-	-	-	-	-	0	0	53,116	936	54,052
1963	-	-	-	0	-	-	-	-	-	-	0	0	0	2,196	2,196
1964	8,347	-	-	8,347	-	-	-	-	-	-	0	0	8,347	1,929	10,276
1965	22,936	-	-	22,936	-	-	-	-	-	-	381	0	23,317	2,071	25,388
1966	69,836	-	1,209	71,045	-	-	-	-	-	-	0	0	71,045	3,157	74,202
1967	36,451	-	1,823	38,274	-	-	-	-	-	-	0	0	38,274	3,343	41,617
1968	49,857	-	3,068	52,925	-	-	-	-	-	-	0	0	52,925	453	53,378
1969	128,866	-	1,722	130,588	-	-	-	-	-	-	722	0	131,310	2,279	133,589
1970	200,306	4,858	3,285	208,449	-	-	-	-	-	-	1,146	0	209,595	2,479	212,074
1971	188,533	-	-	188,533	-	-	-	-	-	-	1,061	0	189,594	1,761	191,355
1972	136,711	12,898	1,313	150,922	-	-	-	-	-	-	1,254	0	152,176	2,532	154,708
1973	173,783	45,304	-	219,087	-	-	-	-	-	-	13,003	0	232,090	2,806	234,896
1974	176,036	53,540	552	230,128	9,213	-	23,551	-	26,884	-	59,648	0	289,776	2,544	292,320
1975	158,183	51,666	5,590	215,439	13,666	-	27,212	-	18,692	-	59,570	0	275,009	2,500	277,509
1976	105,851	21,212	4,250	131,313	1,742	-	5,387	-	17,948	-	25,077	0	156,390	1,000	157,390
1977	131,758	51,994	15,851	199,603	13,980	-	25,730	-	18,673	-	58,383	0	257,986	3,990	261,976
1978	127,947	51,646	11,527	191,120	10,988	1,721	21,016	5,220	13,259	3,687	45,263	10,628	236,383	3,356	239,739
1979	109,406	94,042	25,955	229,403	48,899	3,199	47,459	8,097	34,185	7,170	130,543	18,466	359,946	9,084	369,030
1980	106,829	83,881	13,519	204,229	27,978	4,347	41,771	605	19,452	68	89,201	5,020	293,430	9,000	302,430
1981	167,834	154,883	19,043	341,760	12,082	1,311	86,620	6,955	25,989	3,019	124,691	11,285	466,451	15,260	481,711
1982	97,484	96,581	5,815	199,880	3,894	167	13,593	42	6,820	596	24,307	805	224,187	11,312	235,499
1983	124,371	85,645	10,018	220,034	4,482	1,963	43,993	0	34,089	3,101	82,564	5,064	302,598	25,990	328,588
1984	78,751	70,803	6,429	155,983	7,625	2,215	24,060	57	20,564	56	52,249	2,328	208,232	22,932	231,164
1985	129,948	40,490	5,164	175,602	24,452	2,525	25,338	0	42,352	0	92,142	2,525	267,744	35,746	303,490
1986	59,352	51,307	2,793	113,452	2,045	0	22,053	395	1,892	182	25,990	577	139,442	11,464	150,906
1987	0	0	0	0	0	0	0	0	0	0	0	0	0	40,591	40,591
1988	45,529	31,861	2,090	79,480	15,662	1,421	16,989	0	21,844 c	1,806	54,495	3,227	133,975 c	30,263	164,238 c
5 Yr Ave 1978-82	121,900	96,207	15,172	233,278	20,768	2,149	42,092	4,184	19,941	2,908	82,801	9,241	316,079	9,602	325,682
5 Yr Ave 1983-87	78,484	49,649	4,881	133,014	7,721	1,341	23,089	90	19,779	668	50,589	2,099	183,603	27,345	210,948

a Sales reported in numbers of fish sold in the round and pounds of unprocessed roe.
b May include small amounts of coho salmon roe.
c Does not include 26,988 fall chum salmon sold as part of a new test fishing project.

Appendix Table 5. Commercial coho salmon sales by district, Yukon River drainage, 1961-1988. a

Year	Lower Yukon Area				Upper Yukon Area				Alaska Total
	Dist.1	Dist.2	Dist.3	Subtotal	Dist.4	Dist.5	Dist.6	Subtotal	
1961	2,855	-	-	2,855	-	-	-	0	2,855
1962	22,926	-	-	22,926	-	-	-	0	22,926
1963	5,572	-	-	5,572	-	-	-	0	5,572
1964	2,446	-	-	2,446	-	-	-	0	2,446
1965	350	-	-	350	-	-	-	0	350
1966	19,254	-	-	19,254	-	-	-	0	19,254
1967	9,925	-	1,122	11,047	-	-	-	0	11,047
1968	13,153	-	150	13,303	-	-	-	0	13,303
1969	13,989	-	1,009	14,998	-	-	-	95	15,093
1970	12,632	-	-	12,632	-	-	-	556	13,188
1971	12,165	-	-	12,165	-	-	-	38	12,203
1972	21,705	506	-	22,211	-	-	-	22	22,233
1973	34,860	1,781	-	36,641	-	-	-	0	36,641
1974	13,713	176	-	13,889	-	1,409	1,479	2,888	16,777
1975	2,288	200	-	2,488	-	5	53	58	2,546
1976	4,064	17	-	4,081	-	-	1,103	1,103	5,184
1977	31,720	5,319	538	37,577	-	2	1,284	1,286	38,863
1978	16,460	5,835	758	23,053	32	1	3,066	3,099	26,152
1979	11,369	2,850	-	14,219	155	-	2,791	2,946	17,165
1980	4,829	2,660	-	7,489	30	-	1,226	1,256	8,745
1981	13,129	7,848	419	21,396	-	-	2,284	2,284	23,680
1982	15,115	14,179	87	29,381	15	-	7,780	7,795	37,176
1983	4,595	2,557	-	7,152	-	-	6,168	6,168	13,320
1984	29,472	43,064	621	73,157	1,095	-	7,688	8,783	81,940
1985	27,676	17,125	171	44,972	938	-	11,762	12,700	57,672
1986	24,824	21,197	793	46,814	-	-	441	441	47,255
1987	0	0	0	0	0	0	0	0	0
1988	36,435	34,776	1,419	72,630	2	8	13,972 b	13,982 b	86,612 b
5 Yr Ave 1978-82	12,180	6,674	253	19,108	46	0	3,429	3,476	22,584
5 Yr Ave 1983-87	17,313	16,789	317	34,419	407	0	5,212	5,618	40,037

a Sales reported in numbers of fish sold in the round.
b Does not include 13,295 coho salmon sold as part of a new test fishing project.

Appendix Table 6. Yukon River drainage total estimated commercial related summer chum salmon catch by area and district, 1968-1988.

Year	Lower Yukon Area Total	Upper Yukon Area											
		District 4				District 5			District 6				
		Sold in Round	Females a	Unsold Males	Subtotal b	Numbers	Females a	Subtotal b	Numbers	Females a	Subtotal b	Total b	Alaska Total b
1968	14,470	-	-	-	0	-	-	0	-	-	0	0	14,470
1969	61,966	-	-	-	0	-	-	0	-	-	0	0	61,966
1970	137,006	-	-	-	0	-	-	0	-	-	0	0	137,006
1971	100,090	-	-	-	0	-	-	0	-	-	0	0	100,090
1972	135,668	-	-	-	0	-	-	0	-	-	0	0	135,668
1973	285,509	-	-	-	0	-	-	0	-	-	0	0	285,509
1974	541,877	27,866	-	-	27,866	6,831	-	6,831	13,318	-	13,318	48,015	589,892
1975	517,462	165,054	-	-	165,054	12,997	-	12,997	14,782	-	14,782	192,833	710,295
1976	382,196	211,307	-	-	211,307	774	-	774	6,617	-	6,617	218,698	600,894
1977	359,743	169,541	-	-	169,541	1,274	-	1,274	4,317	-	4,317	175,132	534,875
1978	648,336	364,184	16,920	0	381,104	4,892	605	5,497	34,814	8,236	43,050	429,651	1,077,987
1979	582,787	169,430	35,317	0	204,747	8,608	1,009	9,617	18,491	3,891	22,382	236,746	819,533
1980	744,738	147,560 c	135,824	0 e	283,384	456	-	456	35,855	3,282	39,137	322,977	1,067,715
1981	913,507	59,718 c	187,032	83,695 d	330,445	1,236	49	1,285	32,477	1,987	34,464	366,194	1,279,701
1982	435,946	3,647 c	151,281	102,791 d	257,719	213	21	234	21,597	1,517	23,114	281,067	717,013
1983	713,856	6,672 c	148,125	100,591 d	255,388	42	1,856	1,898	24,309	18	24,327	281,613	995,469
1984	530,694	1,009 c	166,842	110,219 d	278,070	645	47	692	56,249	335	56,584	335,346	866,040
1985	437,377	12,007 c	247,085	168,391 d	427,483	700	-	700	66,913	1,540	68,453	496,636	934,013
1986	669,996	300 c	269,545	195,690 e	465,535	690	-	690	50,483	2,146	52,629	518,854	1,188,850
1987	401,275	29,991 c	121,474	58,335 e	209,800	362	44	406	10,610	450	11,060	221,266	622,541
1988	1,087,335	24,051 c	283,753	182,270 e	490,074	722	405	1,127	40,129	1,835	41,964	533,165	1,620,500
5 Yr Ave 1983-87	550,640	9,996	190,614	126,645	327,255	488	389	877	41,713	898	42,611	370,743	921,383

a Estimated by dividing pounds of unprocessed roe by 1 lb of roe per female (1978-1987) and 0.897 lbs of roe per female (1988) which was calculated from data collected in District 4.

b Subtotals may not be the same as those in Appendix Table 29, since an unknown number of females stripped of roe and incidental males are reported as subsistence catches.

c Assume all fish sold in the round were males.

d Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishwheel (1981 - .566; 1982 - .587; 1983 - .580; 1984 - .600; and 1985 - .578), subtracted by pounds of roe and fish sold in the round.

e Calculated by dividing estimated number of females by proportion of females captured at Stink Creek test fishery (1981-1985 average - .579), subtracted by pounds of roe and fish sold in the round.

Appendix Table 7. Commercial Fisheries Entry Commission (CFEC) salmon permits issued by gear type, Yukon area, 1976-1988. a

Year	Lower Yukon Gill Net b		Upper Yukon Gill Net c		Upper Yukon Fishwheel	
	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished	Permits Issued d	Permits Fished
1976	678	e	118	e	169	e
1977	700	606	69	44	160	130
1978	699	642	71	47	158	137
1979	708	659	70	50	165	127
1980	709	650	71	49	163	127
1981	711	666	70	45	162	125
1982	710	664	76	45	166	111
1983	708	655	73	40	164	114
1984	708	673	73	39	159	96
1985	708	663	71	40	159	113
1986	712	669	74	30	162	101
1987	711	659 f	74	33 f	161	108 f
1988	712	683 f	75	43 f	160	127 f

a Information for 1976-1988 obtained from CFEC unless otherwise indicated.
b Set or drift gill net.
c Set gill net only.
d Includes permanent and interim-use permits.
e Information unavailable.
f Data source: ADF&G.

Appendix Table 8. Number of commercial salmon fishing gear operators (permit holders) by district, Yukon area, 1971-1988. a

CHINOOK SALMON SEASON

	Lower Yukon Area b				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	405	154	33	592	-	-	-	-	592
1972	426	153	35	614	-	-	-	-	614
1973	438	167	38	643	-	-	-	-	643
1974	396	154	42	592	27	31	20	78	670
1975	441	149	37	627	93	52	36	181	808
1976	453	189	42	684	80	46	29	155	839
1977	392	188	46	626	87	41	18	146	772
1978	429	204	22	655	80	45	35	160	815
1979	425	210	22	657	87	34	30	151	808
1980	407	229	21	657	79	35	33	147	804
1981	448	225	23	696	80	43	26	149	845
1982	450	225	21	696	74	44	20	138	834
1983	444	212	19	675	77	34	25	136	811
1984	439	213	20	672	54	31	27	112	784
1985	421	219	18	658	74	32	27	133	791
1986	431	235	7	673	75	21	27	123	796
1987	432	233	10	675	87	30	24	141	816
1988	437	234	13	684	95	28	33	156	840

FALL SEASON

	Lower Yukon Area c				Upper Yukon Area d				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	352	-	-	352	-	-	-	-	352
1972	353	75	3	431	-	-	-	-	431
1973	445	183		628	-	-	-	-	628
1974	322	121	6	449	17	23	22	62	511
1975	428	185	12	625	44	33	33	110	735
1976	422	194	28	644	18	36	44	98	742
1977	337	172	37	546	28	34	32	94	640
1978	429	204	28	661	24	43	30	97	758
1979	458	220	32	710	31	44	37	112	822
1980	395	232	23	650	33	43	26	102	752
1981	462	240	21	723	30	50	30	110	833
1982	445	218	15	678	15	24	25	64	742
1983	455	225	20	700	13	29	23	65	765
1984	427	216	12	655	18	39	26	83	738
1985	416	236	13	665	22	39	25	86	751
1986	377	236	14	627	1	21	16	38	665
1987	403	230	9	642	0	0	0	0	642
1988	453	258	24	735	20	20	32	72	807

COMBINED SEASONS

	Lower Yukon Area				Upper Yukon Area				
Year	Dist. 1	Dist. 2	Dist. 3	Subtotal	Dist. 4	Dist. 5	Dist. 6	Subtotal	Total
1971	473	154	33	660	-	-	-	27	687
1972	476	153	35	664	-	-	-	-	664
1973	529	205	38	772	-	-	-	47	819
1974	485	190	42	717	28	43	27	98	815
1975	491	197	39	727	95	57	46	198	925
1976	482	220	44	746	96	62	56	214	960
1977	402	208	54	664	96	53	39	188	852
1978	472	221	29	722	82	53	38	173	895
1979	461	230	33	724	90	49	40	179	903
1980	432	247	27	706	88	51	38	177	883
1981	507	257	26	790	94	56	31	181	971
1982	486	244	22	752	76	53	27	156	908
1983	458	235	26	719	79	47	31	157	876
1984	453	238	26	717	58	45	33	136	853
1985	434	247	24	705	76	48	33	157	862
1986	444	259	18	721	75	30	27	132	853
1987	440	239	13	692	87	30	24	141	833
1988	460	260	24	744	97	35	38	170	914

a Actual number of gear operators which made at least one delivery. Some individual fishermen in the lower Yukon area may have operated in more than one district during the year.
b Unrestricted mesh size fishing periods.
c Refers to time when 6" or smaller mesh size restriction is in effect after the chinook salmon season.
d Refers to time when fall chum salmon fishery occurs.

Appendix Table 9. Commercial chinook salmon catches by statistical area, lower Yukon area, 1974-1988.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1974	2,935	30,174	6,984	3,987	12,721	2,048	6,826	6,165	71,840
1975	6,396	15,844	8,763	314	1,720	606	6,879	4,063	44,585
1976	8,333	27,937	7,507	851	5,101	1,415	6,164	5,102	62,410
1977	11,278	16,787	8,866	1,216	15,214	1,550	7,109	7,895	69,915
1978	886	12,237	4,135	4,388	22,019	3,738	7,533	4,070	59,006
1979	1,017	13,152	4,149	5,782	12,839	10,960	18,976	8,202	75,077
1980	464	12,832	3,235	9,224	30,737	12,333	13,654	7,903	90,382
1981	6,639	12,875	2,975	8,976	19,730	15,158	22,251	10,902	99,506
1982	3,439	11,268	2,842	9,038	9,331	7,295	18,185	13,052	74,450
1983	7,919	23,523	8,161	14,961	9,416	5,297	19,172	7,008	95,457
1984	14,385	15,320	2,598	6,297	11,123	1,434	19,089	4,425	74,671
1985	4,233	22,696	12,160	2,492	12,806	3,955	25,144	6,525	90,011
1986	4,187	7,954	3,494	5,430	10,258	1,422	15,948	4,342	53,035
1987	14,656	12,056	8,703	3,533	6,780	3,250	18,573	9,092	76,643
1988	6,780	11,154	6,023	4,274	14,123	618	8,703	5,434	57,109

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1974	6,344	5,611	2,624	3,369	-	17,948
1975	3,282	3,045	2,785	2,203	-	11,315
1976	5,083	4,490	3,031	3,952	-	16,556
1977	6,577	4,584	2,110	3,451	-	16,722
1978	9,004	7,953	5,248	8,499	2,220	32,924
1979	10,698	11,214	6,733	7,573	5,280	41,498
1980	11,544	12,903	8,259	9,591	7,707	50,004
1981	12,341	13,275	7,024	5,950	7,191	45,781
1982	10,567	9,236	5,262	8,932	5,135	39,132
1983	12,433	10,424	7,779	6,260	6,333	43,229
1984	9,179	11,573	4,668	5,752	5,525	36,697
1985	11,843	18,584	4,877	4,613	8,448	48,365
1986	11,138	15,326	3,450	4,336	7,599	41,849
1987	14,195	9,672	5,663	6,376	11,552	47,458
1988	6,191	11,605	4,721	6,784	5,887	35,188

District 3

Year	334-31	334-32	Total
1974	1,423	2,057	3,480
1975	2,791	1,386	4,177
1976	1,827	2,321	4,148
1977	1,617	2,348	3,965
1978	746	2,170	2,916
1979	2,195	2,823	5,018
1980	2,039	3,201	5,240
1981	1,241	2,782	4,023
1982	896	1,713	2,609
1983	1,335	2,771	4,106
1984	900	2,139	3,039
1985	854	1,734	2,588
1986	606	295	901
1987	1,698	341	2,039
1988	1,387	380	1,767

Appendix Table 10. Commercial chinook salmon catches by statistical area, upper Yukon area, 1974-1988.

District 4

Year	334-41	334-42	334-43	Total
1974	0	685	-	685
1975	15	374	-	389
1976	44 a	365	-	409
1977	317	668	-	985
1978	183	425	-	608
1979	785	370	834	1,989
1980	352	549	620	1,521
1981	106	867	374	1,347
1982	78	497	512	1,087
1983	0	382	219	601
1984	2	272	687	961
1985	0	318	346	664
1986	11	100	391	502
1987	91	999	434	1,524
1988	19	1,599	1,541	3,159

District 5

Year	334-51	334-52	334-53	334-54	Total
1974	2,284	379	-	-	2,663
1975	2,602	270	-	-	2,872
1976	2,843	308	-	-	3,151
1977	4,013	149	-	-	4,162
1978	2,838	241	-	-	3,079
1979	3,389	0	-	-	3,389
1980	4,554	337	-	-	4,891
1981	97	3,051	2,477	749	6,374
1982	61	2,352	2,277	695	5,385
1983	0	632	2,738	236	3,606
1984	128	1,589	1,568	384	3,669
1985	0	1,142	1,842	434	3,418
1986	0	1,552	875	306	2,733
1987	0	1,183	1,356	566	3,105
1988	0	1,498	1,477	461	3,436

District 6

Year	334-61	334-62	334-63	Total
1974	111	1,102	260	1,473
1975	77	153	270	500
1976	490	320	292	1,102
1977	405	365	238	1,008
1978	34	58	543	635
1979	102	336	334	772
1980	92	1,588	267	1,947
1981	438	366	183	987
1982	414	309	258	981
1983	249	364	298	911
1984	0	375	492	867
1985	15	560	567	1,142
1986	0	597	353	950
1987	0	600	602	1,202
1988	305	253	204	762

a Does not include 493 fish (summer chum salmon) erroneously keypunched as chinook salmon in final computer summary.

Appendix Table 11. Commercial catches of chinook and summer chum salmon by mesh size, Districts 1 and 2, lower Yukon area, 1961-1988.

	Unrestricted Mesh Size a		6 inch Max. Mesh Size b	
	Districts 1 and 2		Districts 1 and 2	
Year	Chinook	Summer Chum	Chinook	Summer Chum
1961	113,434	-	-	-
1962	89,296	-	-	-
1963	109,215	-	-	-
1964	87,801	-	-	-
1965	113,031	-	-	-
1966	87,710	-	-	-
1967	124,574	10,919	-	-
1968	100,857	14,402	-	-
1969	85,387	41,418	97	15,437
1970	73,610	104,705	57	16,623
1971	103,623	42,189	1,176	57,851
1972	85,376	78,698	1,991	37,881
(Avg. 1961-72)	97,826	48,722	830	31,948
1973 c	65,269	89,841	5,168	196,540
1974	86,921	349,758	1,631	227,507
1975	50,614	148,919	4,162	345,472
1976	71,688	267,075	7,631	128,431
1977	81,073	157,909	4,720	205,634
1978	82,070	275,512	7,737	354,603
1979	95,137	136,973	22,136	434,188
1980	120,912	95,876	19,711	605,679
1981	125,698	163,979	18,648	758,767
1982	106,399	225,106	6,887	217,563
1983	107,078	121,927	31,002	590,329
1984	94,456	242,076	16,394	287,531
1985 d	114,300	170,345	22,445	265,240
1986	79,525	231,372	15,307	438,182
1987	102,274	128,017	21,827	269,757
1988	52,801	225,049	39,469	848,321
(Avg. 1979-88)	99,858	174,072	21,383	471,556

a Primarily 8 to 8-1/2 inch mesh size used during early June to early July.
b Catch through July 15-20, relatively few chinook and summer chum salmon taken after these dates.
c Six inch maximum mesh size regulation beginning late June to early July became effective in 1973.
d Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 12. Commercial chinook salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1961-1988. a

Commercial Catch			
Year	Dist. 1	Dist. 2	Total
1961	84,406	29,028	113,434
1962	67,072	22,224	89,296
1963	85,004	24,211	109,215
1964	67,555	20,246	87,801
1965	89,268	23,763	113,031
1966	70,783	16,927	87,710
1967	104,335	20,239	124,574
1968	79,465	21,392	100,857
1969	70,588	14,799	85,387
1970	56,469	17,141	73,610
1971	84,397	19,226	103,623
1972	68,059	17,317	85,376
1973	52,790	12,479	65,269
1974	69,457	17,464	86,921
1975	41,550	9,064	50,614
1976	56,392	15,296	71,688
1977	65,745	15,328	81,073
1978	53,198	28,872	82,070
1979	61,790	33,347	95,137
1980	78,157	42,755	120,912
1981	88,038	37,660	125,698
1982	70,743	35,656	106,399
1983	76,280	30,798	107,078
1984	65,101	29,355	94,456
1985	76,106	38,194	114,300
1986	42,922	36,603	79,525
1987	62,147	40,127	102,274
1988	32,792	20,009	52,801

Effort	District 1		District 2		Total	
	Boat Hrs	CPUE	Boat Hrs	CPUE	Boat Hrs	CPUE
1961	79,224	1.07	29,118	1.00	108,342	1.05
1962	84,792	0.79	38,118	0.58	122,910	0.73
1963	72,288	1.18	27,672	0.87	99,960	1.09
1964	56,736	1.19	22,398	0.90	79,134	1.11
1965	78,096	1.14	31,008	0.77	109,104	1.04
1966	69,894	1.01	22,380	0.76	92,274	0.95
1967	102,456	1.02	37,488	0.54	139,944	0.89
1968	92,450	0.86	32,280	0.66	124,730	0.81
1969	84,864	0.83	27,828	0.53	112,692	0.76
1970	61,260	0.92	20,460	0.84	81,720	0.90
1971	73,272	1.15	19,956	0.96	93,228	1.11
1972	79,236	0.86	19,872	0.87	99,108	0.86
1973	75,036	0.70	23,496	0.53	98,532	0.66
1974	86,256	0.81	29,808	0.59	116,064	0.75
1975	49,944	0.83	8,376	1.08	58,320	0.87
1976	64,572	0.87	23,484	0.65	88,056	0.81
1977	42,618	1.54	15,180	1.01	57,798	1.40
1978	57,528	0.92	25,524	1.13	83,052	0.99
1979	53,040	1.16	23,904	1.40	76,944	1.24
1980	45,348	1.72	20,196	2.12	65,544	1.84
1981	43,632	2.02	19,536	1.93	63,168	1.99
1982	55,416	1.28	22,008	1.62	77,424	1.37
1983	38,448	1.98	18,696	1.65	57,144	1.87
1984	38,880	1.67	14,568	2.02	53,448	1.77
1985	28,176	2.70	14,832	2.58	43,008	2.66
1986	36,936	1.16	20,352	1.80	57,288	1.39
1987	32,796	1.89	18,696	2.15	51,492	1.99
1988	14,280	2.30	7,884	2.54	22,164	2.38

a Chinook salmon season during June and early July with unrestricted mesh size gill nets.

Appendix Table 13. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 1, lower Yukon area, 1974-1988.

	Period Catch a (Cumulative Catch) b														
Date	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
06/01															
06/02															
06/03															
06/04															
06/05	3.5(3.5)					6.1(6.1)									
06/06															
06/07								11.1(11.1)							
06/08	7.5(11.0)					4.9(11.0)									
06/09					2.5(2.5)			15.6(26.7)							
06/10							6.8(6.8)			22.3(22.3)					
06/11		0.2(0.2)													
06/12	14.7(25.7)					19.5(30.5)		14.5(41.2)							
06/13					5.8(8.3)										
06/14		0.4(0.6)		0.04(0.04)			26.1(32.9)			12.7(35.0)					5.9(5.9)
06/15	11.1(36.8)								5.6(5.6)						
06/16			0.1(0.1)			9.3(39.8)		18.3(59.5)						13.0(13.0)	
06/17					17.6(25.9)		14.6(47.5)			28.6(63.6)					16.0(21.9)
06/18		1.1(1.7)		2.6(2.6)					12.4(18.0)						
06/19	18.8(55.6)		3.2(3.3)			16.7(56.5)		28.5(88.0)			13.7(13.7)			22.5(35.5)	
06/20					7.5(33.4)								21.7(21.7)		
06/21		5.7(7.4)		10.4(13.0)			26.2(73.7)			12.7(76.3)					10.9(32.8)
06/22	2.9(58.5)					5.3(61.8)			20.0(38.0)		18.8(32.5)				
06/23			9.6(12.9)				4.5(78.2)							15.0(50.5)	
06/24					14.4(47.8)								10.2(31.9)		
06/25		17.1(24.5)		26.3(39.3)					7.1(45.1)			23.6(23.6)			
06/26	7.2(65.7)		15.4(28.3)								16.1(48.6)			11.6(62.1)	
06/27		9.8(34.3)			5.4(53.2)										
06/28				17.7(57.0)								33.7(57.3)			
06/29	3.8(69.5)								18.1(63.2)		16.5(65.1)				
06/30			13.8(42.1)										5.6(37.5)		
07/01		7.3(41.6)		8.7(65.7)											
07/02			14.3(56.4)						7.5(70.7)			18.8(76.1)			
07/03															
07/04													5.4(42.9)		
07/05															
07/06															
07/07															
07/08															

a Catch by period in thousands of fish.
b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 14. Chinook salmon commercial catch data by period, chinook salmon season (unrestricted mesh size), District 2, Yukon area, 1978-1988.

	Period Catch a (Cumulative Catch) b										
Date	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
06/01											
06/02											
06/03											
06/04		1.6 (1.6)									
06/05											
06/06											
06/07		1.4 (3.0)									
06/08				7.6 (7.6)							
06/09	4.8 (4.8)		3.9 (3.9)								
06/10											
06/11		5.1 (8.1)		11.4 (19.0)							
06/12	3.2 (8.0)		7.8 (11.7)								
06/13						6.0 (6.0)					
06/14											
06/15		14.2 (22.3)		10.5 (29.5)							
06/16	4.3 (12.3)		10.9 (22.6)			7.3 (13.3)					2.7 (2.7)
06/17					4.0 (4.0)						
06/18		3.9 (26.2)		8.2 (37.7)						9.5 (9.5)	
06/19	7.8 (20.1)										
06/20			8.1 (30.7)			10.6 (23.9)					9.0 (11.7)
06/21		7.2 (33.4)			7.8 (11.8)		5.6 (5.6)				
06/22										12.2 (21.7)	
06/23	4.1 (24.2)		12.0 (42.7)			6.9 (30.8)			14.5 (14.5)		8.3 (20.0)
06/24					11.9 (23.7)						
06/25							14.4 (20.0)			10.9 (32.5)	
06/26	4.7 (28.9)										
06/27								7.0 (7.0)	12.3 (26.8)		
06/28					3.4 (27.1)		9.4 (29.4)				
06/29										7.6 (40.1)	
06/30											
07/01					8.6 (35.7)			18.3 (25.3)			
07/02									7.4 (34.2)		
07/03											
07/04								12.9 (38.2)			
07/05											
07/06											
07/07									2.4 (36.6)		
07/08											

a Catch by period in thousands of fish.
b Cumulative catch during unrestricted mesh size fishing periods in thousands of fish.

Appendix Table 15. Commercial salmon catches taken under quotas or guideline harvest ranges, Yukon area, 1974-1988.

Year	Chinook Salmon a			
	Lower Yukon Area	Upper Yukon Area		
	Districts 1 and 2	District 3	District 4	District 5	District 6
1974	-	3,480 (3,000)	685 (1,000)	2,663 (3,000)	1,473 (1,000)
1975	-	4,177 (3,000)	389 (1,000)	2,872 (3,000)	500 (1,000)
1976	-	4,148 (3,000)	409 (1,000)	3,151 (3,000)	1,102 (1,000)
1977	-	3,965 (3,000)	985 (1,000)	4,162 (3,000)	1,008 (1,000)
1978	-	2,916 (2,000)	608 (1,000)	3,079 (3,000)	635 (1,000)
1979 b	-	5,018 (1,800-2,200)	1,989 (900-1,100)	3,389 (2,700-3,300)	772 (900-1,100)
1980	-	5,240 (1,800-2,200)	1,521 (900-1,100)	4,891 (2,700-3,300)	1,947 (900-1,100)
1981	145,287 (60,000-120,000)	4,023 (1,800-2,200)	1,347 (2,250-2,850)	6,374 (2,700-3,300)	987 (600-800)
1982	113,582 (60,000-120,000)	2,609 (1,800-2,200)	1,087 (2,250-2,850)	5,385 (2,700-3,300)	981 (600-800)
1983	138,686 (60,000-120,000)	4,106 (1,800-2,200)	601 (2,250-2,850)	3,606 (2,700-3,300)	911 (600-800)
1984	111,368 (60,000-120,000)	3,039 (1,800-2,200)	961 (2,250-2,850)	3,669 (2,700-3,300)	867 (600-800)
1985	138,376 (60,000-120,000)	2,588 (1,800-2,200)	664 (2,250-2,850)	3,418 (2,700-3,300)	1,142 (600-800)
1986	94,884 (60,000-120,000)	901 (1,800-2,200)	502 (2,250-2,850)	2,733 (2,700-3,300)	950 (600-800)
1987	124,101 (60,000-120,000)	2,039 (1,800-2,200)	1,524 (2,250-2,850)	3,105 (2,700-3,300)	1,202 (600-800)
1988	92,297 (60,000-120,000)	1,767 (1,800-2,200)	3,159 (2,250-2,850)	3,436 (2,700-3,300)	762 (600-800)

Year	Fall Chum and Coho Salmon a			
	Lower Yukon Area c	Upper Yukon Area d		
	Districts 1, 2, and 3	District 4 e	District 5	District 6
1974	230,128 (200,000)	9,213 (10,000)	24,960 (25,000)	28,363 (15,000)
1975	215,439 (200,000)	13,666 (10,000)	27,217 (25,000)	18,745 (15,000)
1976	131,313 (200,000)	1,742 (10,000)	5,387 (25,000)	19,051 (15,000)
1977	199,603 (200,000)	13,980 (10,000)	25,732 (25,000)	19,957 (15,000)
1978	191,120 (200,000)	11,020 (10,000)	21,017 (25,000)	16,325 (15,000)
1979 b	229,403 (120,000-220,000)	49,054 (10,000-40,000)	47,459 (10,000-40,000)	36,976 (7,500-22,500)
1980	204,229 (120,000-220,000)	28,008 (10,000-40,000)	41,771 (10,000-40,000)	20,678 (7,500-22,500)
1981	341,760 (120,000-220,000)	12,082 (10,000-40,000)	86,620 (10,000-40,000)	28,273 (5,500-20,500)
1982	199,880 (120,000-220,000)	3,909 (10,000-40,000)	13,593 (10,000-40,000)	14,600 (5,500-20,500)
1983	220,034 (120,000-220,000)	4,482 (10,000-40,000)	43,993 (10,000-40,000)	40,257 (5,500-20,500)
1984	155,983 (120,000-220,000)	8,720 (10,000-40,000)	24,060 (10,000-40,000)	28,252 (5,500-20,500)
1985	175,602 (120,000-220,000)	25,390 (10,000-40,000)	25,338 (10,000-40,000)	54,114 (5,500-20,500)
1986	113,452 (0-110,000)	2,045 (0-20,000)	22,053 (0-20,000)	2,333 (0-10,250)
1987	0 (0-110,000)	0 (0-20,000)	0 (0-20,000)	0 (0-10,250)
1988	79,480 (0-110,000)	15,664 (0-20,000)	16,997 (0-20,000)	35,816 (0-10,250)

a Quotas or guideline harvest range shown in parenthesis.
b Beginning in 1979 quotas were replaced by guideline harvest level ranges.
c Chum salmon only; coho salmon catch not applied toward quotas or G.H.L.
d Chum and coho salmon combined (does not include roe sales); mostly fall chum.
e Beginning in 1978 quota or guideline harvest levels in effect for area upstream of Cone Point only. Subdistrict 4-A closes August 1.

Appendix Table 16. Commercial chum salmon catches by statistical area, lower Yukon area, 1971-1988.

District 1

Year	334-11	334-12	334-13	334-14	334-15	334-16	334-17	334-18	Total
1971	834	87,740	24,766	34,891	40,617	8,063	67,635	17,915	282,461
1972	5,186	98,909	12,146	25,943	56,039	4,073	38,274	10,375	250,945
1973	17,259	176,119	39,583	18,608	61,969	6,413	52,770	22,706	395,427
1974	38,322	338,412	116,940	22,011	50,593	5,357	37,724	32,681	642,040
1975	28,970	257,485	103,423	12,078	41,295	5,779	99,232	28,244	576,506
1976	26,277	203,024	52,480	9,338	28,848	2,872	32,093	24,123	379,055
1977	34,312	181,459	54,082	9,872	41,799	1,083	41,026	18,777	382,410
1978	5,072	195,080	67,098	56,995	79,352	4,602	75,090	38,443	521,732
1979	1,791	115,528	38,161	43,263	92,706	46,401	93,777	47,713	479,340
1980	3,840	82,898	16,940	46,164	87,270	98,326	109,005	53,638	498,081
1981	25,569	206,200	26,220	76,591	91,722	51,660	143,747	53,283	674,992
1982	9,908	83,130	17,910	54,795	56,632	20,602	60,263	43,760	347,000
1983	42,300	122,374	40,200	75,016	65,665	42,903	121,328	65,749	575,535
1984	42,579	106,209	17,376	54,519	36,021	12,711	73,710	28,302	371,427
1985	14,290	87,872	32,162	46,932	76,155	11,866	79,846	28,311	377,434
1986	39,844	112,778	38,347	55,663	47,790	10,898	97,802	37,357	440,479
1987	34,852	51,350	22,794	15,109	21,646	7,786	45,911	23,450	222,898
1988	82,625	155,531	81,873	61,171	68,444	17,144	139,464	87,475	693,727

District 2

Year	334-21	334-22	334-23	334-24	334-25	Total
1971	2,255	3,144	286	427	-	6,112
1972	3,091	22,746	250	7,718	-	33,805
1973	22,207	56,193	6,181	24,125	-	108,706
1974	39,116	52,514	11,191	24,871	-	127,692
1975	20,947	98,986	11,028	19,844	-	150,805
1976	22,282	58,016	18,173	21,931	-	120,402
1977	26,158	75,281	23,789	32,445	-	157,673
1978	48,868	132,002	31,990	60,770	5,564	279,194
1979	73,509	86,020	29,988	33,069	44,294	266,880
1980	80,931	156,962	75,513	47,772	31,407	392,585
1981	76,143	215,346	88,040	78,218	49,014	506,761
1982	60,611	103,689	27,600	61,685	25,340	278,925
1983	74,985	76,494	80,631	53,099	48,528	333,737
1984	57,212	114,732	50,738	55,259	29,793	307,734
1985	42,042	98,294	28,513	24,770	34,970	228,589
1986	50,865	145,946	41,516	58,531	42,876	339,734
1987	48,734	54,459	19,157	22,988	29,538	174,876
1988	79,329	153,506	61,687	92,676	69,835	457,033

District 3

Year	334-31	334-32	Total
1971	26	24	50
1972	0	1,840	1,840
1973	0	463	463
1974	1,697	576	2,273
1975	0	5,590	5,590
1976	4,450	9,602	14,052
1977	12,839	6,424	19,263
1978	20,028	18,502	38,530
1979	28,272	37,698	65,970
1980	23,646	34,655	58,301
1981	35,597	37,917	73,514
1982	3,896	6,005	9,901
1983	7,713	16,905	24,618
1984	6,876	640	7,516
1985	5,045	1,911	6,956
1986	3,235	0	3,235
1987	3,418	83	3,501
1988	13,211	2,844	16,055

Appendix Table 17. Commercial summer chum salmon sales by statistical area, upper Yukon area, 1974-1988. a,b

District 4

	334-41		334-42		334-43		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,200	-	28,500	-	c	c	27,866	-
1975	105,600	-	59,500	-	c	c	165,054	-
1976	178,300	-	33,000	-	c	c	211,307	-
1977	148,700	-	20,800	-	c	c	169,541	-
1978	309,500	16,920	54,900	0	c	c	364,184	16,920
1979	136,300	35,117	29,200	200	3,900	0	169,430	35,317
1980	119,400	119,957	26,200	14,385	1,800	1,482	147,560	135,824
1981	46,000	160,757	11,800	23,677	1,900	2,598	59,718	187,032
1982	1,000	137,611	1,000	12,550	1,600	1,120	3,647	151,281
1983	3,400	130,013	3,300	17,549	0	563	6,672	148,125
1984	100	148,519	700	15,184	300	3,139	1,009	166,842
1985	5,100	222,149	1,800	19,306	5,100	5,630	12,007	247,085
1986	0	236,856	241	29,169	59	3,520	300	269,545
1987	29,314	110,977	593	9,956	84	541	29,991	121,474
1988	19,070	230,276	4,592	21,766	389	2,484	24,051	254,526

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	4,500	-	d	-	-	-	-	-	6,831	-
1975	13,000	-	0	-	-	-	-	-	12,997	-
1976	700	-	0	-	-	-	-	-	774	-
1977	1,200	-	0	-	-	-	-	-	1,274	-
1978	4,900	605	0	0	-	-	-	-	4,892	605
1979	8,600	1,009	0	0	-	-	-	-	8,608	1,009
1980	500	0	0	0	0	0	0	0	456	0
1981	1,100	0	100	49	0	0	0	0	1,236	49
1982	0	21	200	0	0	0	0	0	213	21
1983	0	242	0	269	0	1,345	0	0	42	1,856
1984	100	0	600	47	0	0	0	0	645	47
1985	0	0	700	0	0	0	0	0	700	0
1986	0	0	682	0	8	0	0	0	690	0
1987	0	0	362	44	0	0	0	0	362	44
1988	0	0	717	337	5	26	0	0	722	363

District 6

	334-61		334-62		334-63		Totals	
Year	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	1,500	-	10,500	-	1,300	-	13,318	-
1975	5,500	-	2,300	-	6,900	-	14,782	-
1976	2,900	-	1,200	-	2,500	-	6,617	-
1977	2,300	-	1,300	-	700	-	4,317	-
1978	2,200	1,468	27,900	6,116	4,800	652	34,814	8,236
1979	300	d	14,800	d	3,500	d	18,491	3,891
1980	5,200	0	29,400	2,272	4,300	1,010	35,855	3,282
1981	4,600	0	23,500	925	4,200	1,062	32,477	1,987
1982	5,000	0	12,500	1,027	4,200	490	21,597	1,517
1983	1,900	0	21,600	18	700	0	24,309	18
1984	3,800	0	42,200	152	10,200	183	56,249	335
1985	800	0	51,100	142	15,000	1,398	66,913	1,540
1986	4,697	0	31,647	1,711	14,139	435	50,483	2,146
1987	2,167	0	6,882	349	1,561	101	10,610	450
1988	7,978	71	24,911	1,165	7,240	410	40,129	1,646

a Roe in pounds and may include small amounts of chinook salmon roe.
b Majority of summer chum salmon catches rounded to nearest 100.
c Combined with statistical area 334-42.
d Information not available.

Appendix Table 18. Commercial fall chum salmon sales by statistical area, upper Yukon area, 1974-1988. a,b

District 4

	334-41		334-42		334-43		Totals	
Year	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	-	-	9,213	-	c	c	9,213	-
1975	2,200	-	11,400	-	c	c	13,666	-
1976	400	-	1,300	-	c	c	1,742	-
1977	1,700	-	12,300	-	c	c	13,980	-
1978	-	-	11,000	1,721	c	c	10,988	1,721
1979	-	-	33,000	3,199	15,900	0	48,899	3,199
1980	-	-	15,300	1,789	12,900	2,558	27,978	4,347
1981	-	-	5,800	1,311	6,300	0	12,082	1,311
1982	-	-	1,000	20	2,900	147	3,894	167
1983	-	-	3,700	1,591	800	372	4,482	1,963
1984	-	-	3,000	1,222	4,700	993	7,625	2,215
1985	-	-	14,500	891	10,000	1,634	24,452	2,525
1986	-	-	2,045	0	0	0	2,045	0
1987	-	-	0	0	0	0	0	0
1988	-	-	10,157	703	5,505	718	15,662	1,421

District 5

	334-51		334-52		334-53		334-54		Totals	
Year	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	23,600	-	d	-	-	-	-	-	23,551	-
1975	27,212	-	-	-	-	-	-	-	27,212	-
1976	5,300	-	100	-	-	-	-	-	5,387	-
1977	25,600	-	0	-	-	-	-	-	25,730	-
1978	20,700	3,946	300	1,274	-	-	-	-	21,016	5,220
1979	47,400	8,097	100	0	-	-	-	-	47,459	8,097
1980	40,300	605	2,000	0	0	0	0	0	41,771	605
1981	0	178	34,000	6,760	48,600	17	4,100	0	86,620	6,955
1982	8,300	0	1,100	23	4,300	19	0	0	13,593	42
1983	3,100	0	19,800	0	18,000	0	3,100	0	43,993	0
1984	1,400	0	10,300	0	9,400	0	2,900	57	24,060	57
1985	600	0	9,300	0	13,300	0	2,200	0	25,338	0
1986	1,332	0	11,907	395	7,471	0	1,343	0	22,053	395
1987 d	0	0	0	0	0	0	0	0	0	0
1988	0	0	9,684	0	4,533	0	2,772	0	16,989	0

District 6

	334-61		334-62		334-63		Totals	
Year	Number	Roe	Numbers	Roe	Numbers	Roe	Numbers	Roe
1974	9,600	-	15,400	-	1,900	-	26,884	-
1975	13,300	-	2,800	-	2,600	-	18,692	-
1976	6,400	-	7,900	-	3,600	-	17,948	-
1977	3,600	-	11,100	-	3,900	-	18,673	-
1978	4,700	1,826	8,000	1680	500	181	13,259	3,687
1979	7,100	e	21,600	e	5,500	e	34,185	7,170
1980	6,300	0	11,200	53	2,200	15	19,452	68
1981	4,900	0	18,900	2784	2,300	235	25,989	3,019
1982	700	0	4,600	596	1,500	0	6,820	596
1983	3,500	0	23,100	3009	7,500	92	34,089	3,101
1984	5,600	0	11,800	0	3,200	56	20,564	56
1985	1,500	0	34,700	0	6,200	0	42,352	0
1986	176	0	1,345	182	371	0	1,892	182
1987 d	0	0	0	0	0	0	0	0
1988 f	4,500	0	13,617	1,035	3,727	771	21,844	1,806

a Roe in pounds and may include small amounts of coho salmon roe.
b Majority of fall chum salmon catches rounded to nearest 100.
c Combined with statistical area 334-42.
d Does not include estimates of catches involving illegal salmon and salmon roe sales.
e Information not available.
f Does not include 26,988 fall chum salmon sold as part of a new test fishing project in District 6.

Appendix Table 19. Commercial summer chum salmon catch and effort data, Districts 1 and 2, lower Yukon area, 1967-1988.

	District 1					District 2				
Year	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)	Duration	Days Fished	Boat Hours	Catch	(Catch/Boat Hour)
1967	6/08-6/27	11.0	77,208	9,494	0.12	-	-	-	-	-
1968	6/06-7/03	14.0	91,380	12,995	0.14	6/13-7/02	10.5	27,600	1,407	0.05
1969	6/02-6/28	12.5	84,864	8,840	0.10	6/15-7/01	8.0	16,620	5,024	0.30
1970	6/11-7/03	10.5	58,056	87,169	1.50	6/14-7/03	9.0	15,756	17,536	1.11
1971	6/14-7/03	10.5	73,032	36,077	0.49	6/20-7/05	8.5	17,832	6,112	0.34
1972	6/08-7/01	12.5	79,236	69,658	0.88	6/15-7/01	8.5	19,296	9,040	0.47
1973 a	6/07-7/11	14.5	100,284	191,840	1.91	6/10-7/14	14.5	36,000	56,481	1.57
1974	6/03-7/13	16.5	114,624	461,025	4.02	6/05-7/16	15.5	35,316	72,281	2.05
1975	6/09-7/16	15.0	86,304	394,447	4.57	6/11-7/18	10.5	21,024	99,139	4.72
1976	6/14-7/14	12.0	90,658	272,493	3.01	6/20-7/16	11.0	32,624	99,190	3.04
1977	6/13-7/12	12.0	63,036	232,427	3.69	6/19-7/15	10.0	27,048	102,759	3.80
1978	6/08-7/15	13.5	100,008	393,785	3.94	6/08-7/14	13.5	44,376	218,196	4.92
1979	6/04-7/14	13.5	106,680	369,934	3.47	6/03-7/13	13.5	44,748	172,838	3.86
1980	6/09-7/15	12.8	89,412	391,252	4.38	6/08-7/17	12.5	48,060	308,704	6.42
1981	6/06-7/14	12.0	94,656	507,158	5.36	6/07-7/16	12.0	46,560	351,458	7.55
1982	6/14-7/13	9.5	81,240	248,950	3.06	6/16-7/16	10.0	37,920	180,321	4.76
1983	6/09-7/15	11.0	94,920	451,164	4.75	6/12-7/18	11.0	44,712	248,092	5.55
1984	6/18-7/13	8.0	67,776	291,966	4.31	6/20-7/16	8.0	32,208	234,677	7.29
1985 b	6/24-7/15	6.3	52,116	247,486	4.75	6/26-7/18	7.3	27,834	188,099	6.76
1986	6/14-7/15	8.5	66,768	381,127	5.71	6/15-7/14	7.5	33,954	288,427	8.49
1987	6/15-7/10	6.0	53,736	222,898	4.15	6/17-7/09	5.0	26,124	174,876	6.69
1988	6/09-7/15	7.0	55,692	648,198	11.64	6/12-7/14	7.0	33,456	425,172	12.71

a Six inch maximum mesh size regulation during late June to early July became effective in 1973.

b Six inch maximum mesh size regulation by emergency order during commercial fishing season became effective in 1985.

Appendix Table 20. Commercial coho and fall chum salmon catch and effort data, District 1, lower Yukon area, 1961-1988.

Year	Duration	Days Fished a	Boat Hours	Coho Catch	Coho (Catch/Boat Hour)	Fall Chum Catch	Fall Chum (Catch/Boat Hour)
1961	8/01-8/31	16	14,772	2,855	0.19	42,461	2.87
1962	8/01-9/03	21	46,950	22,926	0.49	53,116	1.13
1963	8/09-9/06	18	2,100	5,572	2.65	no purchases	
1964	8/03-8/27	17	8,346	2,446	0.29	8,347	1.00
1965	8/02-8/04	b	b	350	b	22,936	b
1966	7/25-9/10	28	41,994	19,254	0.46	69,836	1.66
1967	7/24-8/27	21	19,272	9,925	0.51	36,451	1.89
1968	7/22-8/28	22	47,232	13,153	0.28	49,857	1.06
1969	7/21-8/23	20	39,408	14,041	0.36	128,866	3.27
1970	7/20-8/26	22	56,160	12,245	0.22	200,306	3.57
1971	7/22-8/28	22	85,344	11,582	0.14	178,744	2.09
1972	7/20-8/26	22	81,726	19,655	0.24	134,752	1.65
1973	7/19-8/25	22	107,136	34,860	0.33	173,783	1.62
1974	7/18-8/14	12	41,868	13,758	0.33	137,235	3.28
1975	7/21-8/16	12	52,128	2,240	0.04	158,183	3.03
1976	7/19-8/13	11	55,026	4,084	0.07	91,091	1.66
1977	7/18-8/23	11	50,568	30,588	0.60	129,486	2.56
1978	7/17-8/29	13	56,184	16,262	0.29	127,947	2.28
1979	7/19-8/14	8	47,352	11,231	0.24	101,400	2.14
1980	7/17-8/19	7	24,216	4,819	0.20	106,829	4.41
1981	7/16-8/17	7	35,520	11,174	0.31	167,834	4.73
1982	7/19-8/13	8	40,944	15,114	0.37	91,271	2.23
1983 c	7/18-8/12	6	25,848	4,560	0.18	124,371	4.81
1984 c	7/16-8/17	6	21,240	29,472	1.39	78,751	3.71
1985 c	7/18-8/13	5	20,592	27,674	1.34	124,801	6.06
1986 d	8/04-8/22	4	13,662	24,824	1.82	59,352	4.34
1987	No Openings						
1988 e	8/08-8/30	3	9,408	36,435	3.87	45,529	4.84

a One day is equivalent to 24 hours during open fishing period.
b Information unavailable.
c District was divided into a Set Net Only (24 hour) area and a Gill Net (12 hour) area.
d District was divided into a Set Net Only (24 or 12 hour) area and a Gill Net (12 or 6 hour) area.
e District was divided into a Set Net Only (12 hour) area and a Gill Net (6 hour) area.

Appendix Table 21. Fall chum salmon commercial catch data by period, District 1, lower Yukon area, 1977-1988.

	Period Catch (Cumulative Catch) a											
Date	1977	1978	1979	1980	1981 b	1982	1983 c	1984 d	1985 e	1986 f	1987 g	1988 h
07/18		6.3 (6.3)		4.2 (4.2)					6.3 (6.3)			
07/19	21.4 (21.4)						16.1 (16.1)					
07/20			6.0 (6.0)			4.3 (4.3)						
07/21		5.1 (11.4)			6.0 (6.0)							
07/22	2.0 (23.4)			6.6 (10.8)								
07/23						27.8 (32.1)						
07/24			7.2 (13.2)		1.3 (7.3)							
07/25		52.8 (64.2)		10.4 (21.2)								
07/26	9.7 (33.1)											
07/27			14.8 (28.0)			4.0 (36.1)						
07/28		2.8 (67.0)			57.3 (64.6)							
07/29	7.7 (40.8)			15.3 (36.5)			3.0 (19.1)					
07/30						11.7 (47.8)						
07/31			9.7 (37.7)	1.4 (37.9)	23.2 (87.8)			18.3 (18.3)				
08/01		14.4 (81.4)										
08/02	0.9 (41.7)						18.5 (37.6)		2.2 (8.5)			
08/03			17.5 (55.2)					17.1 (35.4)				
08/04		0.4 (81.8)				7.9 (55.7)						
08/05	3.2 (44.9)			6.2 (44.1)			23.7 (61.3)			11.4 (11.4)		
08/06						1.2 (56.9)			15.2 (23.7)			
08/07			37.8 (93.0)	13.5 (57.6)				1.8 (37.2)				
08/08		1.4 (83.2)								7.5 (18.9)		
08/09	50.0 (94.9)						44.0 (105.3)		35.8 (59.5)			32.5 (32.5)
08/10			1.3 (94.3)			13.7 (70.6)						
08/11		1.6 (84.8)		5.2 (62.8)								
08/12	1.5 (96.4)					20.7 (91.3)	19.1 (124.4)			10.5 (29.4)		
08/13					43.8 (131.6)				65.3 (124.8)			
08/14			7.1 (101.4	1.8 (64.6)				11.8 (49.0)				
08/15		1.4 (86.2)							16.2 (45.6)			
08/16	16.6 (113.0)											
08/17								10.1 (59.1)				
08/18		10.2 (96.4)			3.9 (135.5)							
08/19				42.2 (106.8)					5.8 (51.4)		0.5 (33.0)	
08/20	7.0 (120.0)											
08/21												
08/22		21.9 (118.3)							8.0 (59.4)			
08/23	5.8 (125.8)										6.9 (39.9)	
08/24												
08/25		4.4 (122.7)										
08/26											4.1 (44.0)	
08/27												
08/28												
08/29		5.2 (127.9)										
08/30											1.5 (45.5)	

a Period and cumulative catches in thousands of fish. Fall chum salmon run usually well underway in the lower Yukon River by July 18.
b Season closed 8/01-8/12.
c Season closed 7/20-7/27.
d Season closed 7/18-8/01 and 8/8-8/12.
e Season closed 7/20-7/31.
f Season closed 7/16-8/03.
g Season closed.
h Season closed 7/16-8/07.

Appendix Table 22. Fall Chum and coho salmon commercial catch and effort in the Set Net Only Gill Net areas, District 1, Yukon area, 1983-1988.

	Set Net Area			Gill Net Area			Total		
Year	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman	No. of Fishermen	Catch	Average Catch per Fisherman
				Fall Chum Salmon					
1983	137	46,583	340	175	61,649	352	312	108,232	347
1984	137	34,817	254	164	24,307	148	301	59,124	196
1985	159	64,838	408	153	53,694	351	312	118,532	380
1986	122	28,449	233	160	30,903	193	282	59,352	210
1987 a									
1988	120	21,971	183	208	23,558	113	328	45,529	139
				Coho Salmon					
1983	137	1,021	7	175	3,536	20	312	4,557	15
1984	137	15,077	110	164	14,390	88	301	29,467	98
1985	159	12,841	81	153	14,832	97	312	27,673	89
1986	122	9,334	77	160	15,490	97	282	24,824	88
1987 a									
1988	120	13,408	112	208	23,027	111	328	36,435	111
				Combined					
1983	137	47,604	347	175	65,185	372	312	112,789	362
1984	137	49,894	364	164	38,697	236	301	88,591	294
1985	159	77,679	489	153	68,526	448	312	146,205	469
1986	122	37,783	310	160	46,393	290	282	84,176	298
1987 a									
1988	120	35,379	295	208	46,585	224	328	81,964	250

a Season closed.

Appendix Table 23. Commercial salmon pack by species and type of processing, Yukon area, 1960-1988. a

	Cases (48#)			Fresh-Frozen (round wt. in lbs.)			Cured Chinook		Cured Chum		Salmon Roe
								Half		Half	
Year	Chinook	Coho	Chum	Chinook	Coho	Chum	Tierces	Tierces	Tierces	Tierces	(lbs.)
1960	13,000			b	b	b	250	180			
1961	19,474			b	b	b	504	146			
1962	15,959	512	1,760	b	b	b	464	280			
1963	16,400	1,190		b	b	b	b	b			
1964	12,041			b	17,000	66,770	537	499			
1965	18,149			275,000	2,500	160,500	670	67			
1966	14,026	836	2,812	414,000	61,355	301,240	398	60			
1967	21,503		126	475,900	66,400	366,496	627	96			1,755
1968	19,499		816	561,690	93,154	454,409	351	170			21,000
1969	9,560	1,104	4,499	423,597	26,973 c	829,586 c	647	95	15		29,000
1970	6,431	1,002	6,413	716,600	12,900	1,725,000	447	191	51		26,300
1971	6,500	502	3,213	1,058,034	45,836	1,432,455	659	229	139		55,177
1972	7,418	1,005	6,249	1,002,395	83,960	1,495,922	497	147			85,278
1973	5,227	1,008	9,902	1,339,317	181,928	2,929,532	61	133		72	137,594
1974	6,660	603	21,074	1,062,666	58,816	3,879,300	381	56	57		208,842
1975	5,297	40	14,226	781,902	13,299	4,751,941	80	53	45	119	201,404
1976	3,921	80	11,375	1,398,779	29,778	4,256,679	93	92	72	10	226,893
1977	4,642	415	9,428	1,513,484	270,241	4,877,918	180	237	26		210,568
1978	5,711	74	9,340	1,473,354	168,241	8,639,156	222	117	7	75	261,422
1979	6,277	22	7,854	2,014,156	108,011	8,098,075	112	91		2	410,540
1980	8,764	130	15,783	3,341,262	56,295	8,781,062	29	18		37	579,927
1981	1,107	378	11,573	3,686,238	130,097	11,398,680	25	13	9	28	507,550
1982		7	751	2,790,456	246,500	4,992,877		19		1	584,053
1983		198	1,181	3,000,843	72,447	10,637,613	5	39		7	426,220
1984		5	1,768	2,426,205	590,526	5,516,532		36		16	468,244
1985				2,953,199	409,725	5,462,462		9		20 d	476,024
1986				2,012,324	299,054	5,960,857		15		28 e	502,952
1987				2,830,312	0	3,013,889		36			286,099
1988				1,970,879	624,734	9,111,943		10		22 f	577,748

a Pack represents type of processing when fish were shipped out of districts.
b Information not available.
c Includes approximately 11,600 and 110,500 (round weight) of coho and chum salmon respectively, as salted fish for Japanese market.
d Additionally 13 half tierces of coho salmon were packed.
e Additionally 2 half tierces of coho salmon were packed.
f Additionally 1 half tierce of coho salmon was packed.

Appendix Table 24. Dollar value estimates of Yukon area commercial salmon fishery, 1961-1988.

Year	Gross Value of Catch to Fishermen					Wholesale Value of Pack a	State Tax b Revenues
	Chinook	Coho	Chum	Roe	Total		
1961	420,900	1,400	14,700	-	437,000	1,292,300	37,500
1962	330,300	11,500	20,100	-	361,900	1,275,250	50,400
1963	409,500	2,800	-	-	412,300	1,500,400	42,000
1964	351,000	1,200	2,200	-	354,400	1,203,800	35,000
1965	531,400	200	10,700	-	542,300	1,412,700	42,000
1966	419,900	9,600	25,000	-	454,500	1,308,100	37,000
1967	583,700	5,500	17,200	-	606,400	1,864,800	41,700
1968	494,300	6,700	34,000	-	535,000	1,655,200	47,000
1969	415,000	8,200	96,000	-	519,200	1,976,200	40,000
1970	401,300	10,300	211,500	-	623,100	2,113,100	45,000
1971	590,100	10,000	182,900	-	783,000	2,106,600	42,000
1972	547,800	20,400	215,800	-	784,000	2,405,200	45,300
1973	561,400	46,500	609,100	-	1,217,000	4,453,900	62,800
1974	881,300	28,400	1,011,300	-	1,921,000	6,035,900	84,100
1975	589,000	3,500	1,201,400	-	1,793,900	4,939,700	87,100
1976	983,500	8,600	1,158,900	-	2,151,000	6,815,500	96,900
1977	1,928,400	143,000	1,997,300	-	4,068,700	10,499,400	151,000
1978	2,133,700	79,200	3,101,800	-	5,314,700	14,194,800	179,400
1979	3,008,000	84,400	4,527,100	-	7,619,500	19,048,800	248,600
1980	3,639,300	21,800	2,311,600	365,200	5,871,300	14,678,250	205,400
1981	4,635,500	91,900	5,323,300	601,100	10,651,800	26,629,500	322,500
1982	3,871,300	153,700	2,693,800	422,500	7,141,300	17,853,250	222,000
1983	4,198,600	29,000	2,499,800	257,400	6,984,800	17,462,000	230,000
1984	3,620,400	268,800	1,498,000	301,800	5,689,000	14,222,500	194,000
1985	4,389,100	202,600	1,952,700	487,200	7,031,600	17,579,000	227,100
1986	3,238,500	212,500	2,232,400	565,400	6,248,800	15,622,000	205,200
1987	5,521,100	0	1,372,400	270,800	7,164,300	17,910,750	232,700
1988	5,605,800	769,400	5,880,200	1,123,300	13,378,700	33,446,750	420,800

a Based on type of processing when fish were shipped out of the area.

b Processors tax and vessel and crewmember license fees. Does not include CFEC permit fee.

Appendix Table 25. Estmated average prices paid to fishermen, Yukon area, 1964-1988.

PRICE PER FISH

	Lower Yukon Area				Upper Yukon Area			
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho
1964	3.75		0.25	0.50				
1965	4.50		0.35					
1966	4.50		0.35	0.50				
1967	4.50	0.35	0.35	0.50				
1968	4.64	0.50	0.50	0.50				
1969	4.60	0.50	0.50	0.55				
1970	5.00	0.61	0.61	0.84				
1971	5.34	0.64	0.64	0.82				
1972	5.90	0.75	0.75	0.92				
1973	7.45	1.18	1.18	1.27				
1974	9.00	1.36	1.58	1.75	8.67	1.00	1.00	1.00
1975	9.24	1.30	1.50	1.51	16.25	1.12	1.12	1.12
1976	11.17	1.56	1.80	1.78	12.96	1.22	1.22	1.22
1977	20.32	2.80	3.60	3.75	24.17	1.75	1.75	1.75
1978	21.60	3.20	3.62	4.20	15.38	1.54	1.97	1.97
1979	22.74	3.87	5.05	5.87	20.20	1.65	2.24	2.24
1980	23.41	1.38	1.93	2.32	13.60	1.52	2.08	1.89
1981	29.76	3.00	4.40	4.08	23.70	1.42	2.59	2.00
1982	32.43	2.80	4.27	4.59	21.83	1.28	2.10	2.41
1983	28.70	2.45	2.69	2.45	20.63	1.06	1.46	1.86
1984	30.75	1.77	2.40	3.50	18.62	1.47	1.90	1.46
1985	30.45	2.35	3.62	3.92	15.82	1.40	1.88	2.11
1986	32.93	2.62	3.53	4.47	17.53	1.34	1.12	1.26
1987	42.97	3.33			15.80	1.29		
1988	58.21	4.62	7.98	10.07	19.34	1.59	2.52	2.44

PRICE PER POUND

	Lower Yukon Area				Upper Yukon Area				
Year	Chinook	Summer Chum	Fall Chum	Coho	Chinook	Summer Chum	Fall Chum	Coho	Roe
1964	0.17		0.03						
1965	0.20								
1966	0.20								
1967	0.19	0.05	0.05	0.07					
1968	0.18	0.06	0.06						
1969	0.19	0.08	0.08	0.08					
1970	0.22	0.09	0.09	0.12					
1971	0.24	0.10	0.10	0.12					
1972	0.24	0.11	0.11	0.13					
1973	0.30	0.16	0.16	0.18					
1974	0.38	0.21	0.21	0.25	0.50	0.15	0.13	0.15	0.75
1975	0.42	0.20	0.20	0.21	0.92	0.17	0.14	0.17	1.16
1976	0.51	0.24	0.24	0.27	0.74	0.19	0.16	0.19	1.33
1977	0.85	0.40	0.45	0.50	1.37	0.27	0.22	0.27	2.66
1978	0.90	0.45	0.47	0.60	0.87	0.24	0.25	0.24	a
1979	1.09	0.52	0.68	0.80	1.00	0.25	0.29	0.25	3.00
1980	1.04	0.20	0.28	0.36	0.85	0.23	0.27	0.29	2.50
1981	1.20	0.40	0.55	0.60	1.00	0.20	0.35	0.35	3.00
1982	1.41	0.40	0.55	0.69	1.02	0.18	0.28	0.37	2.75
1983	1.40	0.34	0.34	0.35	1.08	0.16	0.19	0.31	1.66
1984	1.50	0.26	0.32	0.50	0.95	0.23	0.26	0.24	1.78
1985	1.50	0.35	0.47	0.53	0.86	0.23	0.25	0.33	1.94
1986	1.63	0.38	0.49	0.71	0.89	0.22	0.14	0.21	2.08
1987	1.98	0.49			0.79	0.19			2.22
1988	2.97	0.66	1.01	1.38	1.04	0.23	0.32	0.37	4.33

a Data unavailable.

Appendix Table 26. Average weight of salmon, commercial catch, Yukon area, 1964-1988.

	Average Weight in Pounds a							
	Lower Yukon Area				Upper Yukon Area			
Year	Summer Chinook	Fall Chum	Summer Chum	Coho	Summer Chinook	Fall Chum	Summer Chum	Coho
1964	22.6							
1965	23.0							
1966	23.0							
1967	24.0			7.3				
1968	26.5							
1969	23.9			6.7				
1970	22.3			7.1				
1971	22.6			6.9				
1972	24.6	6.6	7.6	7.1				
1973	24.5	6.8	7.9	7.1				
1974	23.7	6.5	7.5	7.0	17.3	6.7	7.7	6.7
1975	22.0	6.5	7.5	7.2	17.7	6.6	8.0	6.6
1976	21.9	6.5	7.5	6.6	18.4	6.4	8.0	7.5
1977	23.9	7.0	8.0	7.5	17.6	6.5	8.0	6.5
1978	24.0	7.1	7.7	7.0	20.2	6.8	7.4	6.4
1979	20.9	7.4	7.4	7.3	20.2	6.6	7.7	6.5
1980	22.5	6.9	6.9	6.4	16.0	6.6	7.7	6.5
1981	24.8	7.5	8.0	6.8	23.7	7.1	7.4	5.7
1982	23.0	7.1	7.7	6.7	21.4	7.1	7.5	6.5
1983	20.5	7.2	7.9	7.0	19.1	6.6	7.7	6.0
1984	20.5	6.8	7.5	7.0	19.6	6.4	7.3	6.1
1985	20.3	6.7	7.7	7.4	18.4	6.1	7.5	6.4
1986	20.2	6.9	7.2	6.3	19.7	6.1	8.0	6.0
1987	21.7	6.8			20.0	6.8		
1988	19.6	7.0	7.9	7.3	18.6	6.9	7.9	6.6

a Information not available for some species. Data obtained from age-length-weight samples or fish ticket entries.

Appendix Table 27. Yukon River chinook salmon subsistence catches in numbers of fish by village, 1975-1988. a

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Mouth to Anuk River														
Sheldons Pt.	108	122	302	546	91	427	163	79	1,021	802	143	592	1,173	302
Alakanuk	130	363	213	1,125	893	1,595	423	336	1,582	1,028	517	1,027	1,180	738
Emmonak	55	398	62	2,738	1,362	1,175	1,021	1,328	2,436	2,099	1,382	1,754	2,518	1,786
Kotlik	204	472	173	837	533	472	675	568	1,224	695	1,029	1,902	2,407	1,112
Subtotal	497	1,355	750	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020 g
Anuk River to Owl Slough														
Mt. Village	394	397	172	817	1,025	843	811	218	1,875	1,217	672	1,367	2,252	740
Pitkas Pt.-St. Marys	438	1,273	576	1,314	1,718	1,297	1,380	985	2,432	2,663	778	1,717	2,457	1,378
Pilot Station	107	502	556	1,027	804	433	399	428	2,703	1,116	896	1,452	2,593	674
Marshall	436	694	364	806	721	1,101	990	478	2,055	2,176	1,122	1,947	2,564	1,031
Subtotal	1,375	2,866	1,668	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866	3,823
Owl Slough to Bonasila R.														
Russian Mission	2,098	1,328	639	1,498	1,476	1,660	1,689	1,628	2,634	1,938	974	1,747	2,036	1,850
Holy Cross	2,792	1,492	1,920	2,404	1,787	3,123	2,312	1,731	2,276	2,456	2,368	2,505	2,625	2,593
Subtotal	4,890	2,820	2,559	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443
Lower Yukon Total	6,762	7,041	4,977	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286
Bonasila R. to Illinois Cr.														
Anvik	83	84	67	180	261	161	191	354	744	576	405	959	428	211
Grayling	100	117 b	149	292	391	3,664	222	294	951	879	903	1,837	1,322	1,571
Kaltag	192	57	216	127	435	694	179	344	652	487	669	1,080	1,117	1,168
Nulato	1,119	968	1,531	1,354	1,245	2,297	1,117	811	1,135	966	1,063	1,835	1,573	1,986
Koyukuk	50	437	752	518	495	699	541	493	966	1,009	194	569	609	711
Galena	1,294	435	1,155	945	1,591	1,205	570	735	1,477	1,226	1,329	1,046	1,270	1,982
Ruby-Kokrines	912	1,959	735	1,539	2,221	1,736	964	1,168	2,346	1,107	1,657	1,263	927	1,402
Subtotal	3,750	4,057	4,605	4,955	6,639	10,456	3,784	4,199	8,271	6,250	6,220	8,589	7,246	9,031
Illinois Cr. to U.S. Can. Border														
Tanana	80	1,338	858	1,851	1,604	5,711	2,517	2,230	5,547	2,682	1,248	1,672	4,021	3,537
Rampart	517	581	1,194	987	1,820	1,169	488	887	1,070	876	1,302	1,700	2,815	3,145
Stevens Village	362	643 c	1,242 c	3,178	2,194 c	3,962 c	2,387 c	3,745 c	5,203 c	4,676 c	4,628 c	4,601 c	4,363 c	4,889 c
Beaver	168	188	299	558	394	506	552	250	220	553	506	708	466	940
Ft. Yukon	215	1,158	1,061	2,642	1,922	2,527	2,794	1,894	1,887	3,608	2,900	3,083	3,950	2,245
Circle	16	528	304	212	1,175	769	728	969	648	545	2,259	2,233	1,614	2,034
Eagle	20	633	1,171	963	2,888	2,880	3,782	2,864	2,183	1,998	2,247	1,915	2,020	2,333
Subtotals	1,378	5,069	6,129	10,391	11,997	17,524	13,248	12,839	16,758	14,938	15,090	15,912	19,249	19,123

-Continued-

Appendix Table 27. Yukon River chinook salmon subsistence catches in numbers of fish by village, 1975-1988 (Continued).

Village	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Innoko River														
Shageluk	-	11	-	-	62	35	10	-	-	-	-	53	47	104
Subtotal	-	11	-	-	62	35	10	-	-	-	-	53	47	104
Koyukuk River														
Huslia	23	21	50	132	146	154	61	125	459	169	144	82	182	89
Hughes	25	155	72	216	180	226	402	479	318	856	778	296	177	29
Alatna	0	0	1	7	2	20	0	6	6	2	-	-	-	27
Allakaket	151	231	172	239	236	197	185	268	700	373	283 d	563 d	309 d	339
Subtotal	199	407	295	594	564	597	648	878	1,483	1,400	1,205	941	668	484
Tanana River														
Minto-Manley	213	326	752	298	269	764	711	797	1,265	722	2,130	971	414	1,038
Nenana	533	864	742	807	800	771	974	1,195	966	2,556	4,919	2,093	3,151	3,846
Fairbanks	32	31	81	126	264	291	400	451	475	321	326	637	531	557 g
Subtotal	778	1,221	1,575	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441
Chandalar River														
Venetie	-	-	-	14	-	160	52	20	22	51	-	32	13	121
Subtotal	-	-	-	14	-	160	52	20	22	51	-	32	13	121
Upper Yukon Total	6,105	10,765	12,604	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,304
Alaska Total	12,867	17,806	17,581	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,590
Yukon Territory Villages														
Old Crow Porcupine R.	100	25	29	-	100	-	100	400	200	500	150	300	51	100
Dawson	-	500	531	421	1,200	-	1,016	20	-	-	-	-	-	-
Stewart River	-	-	-	-	-	-	1,000	62	-	-	-	-	-	-
Mayo-Stewart Crossing	-	-	61	105	-	-	-	720	-	-	-	-	-	-
Durwash-Kluane River	-	-	-	-	-	-	-	0	-	-	-	-	-	-
Fort Selkirk	-	-	-	-	-	-	-	164	-	-	-	-	-	-
Pelly	-	200	265	500	-	-	-	3,142	-	-	-	-	-	-
Faro	-	-	-	-	-	-	3,286	-	-	-	-	-	-	-
Ross River	-	-	-	-	-	-	-	440	-	-	-	-	-	-
Minto	-	-	-	-	-	-	400	-	-	-	-	-	-	-
Carmacks	-	800	1,121	1,280	3,000	-	-	3,172	-	-	-	-	-	-
Lake Labarge-Whitehorse	-	-	-	-	-	-	3,042	7	-	-	-	-	-	-
Teslin-Johnson's Crossing	-	-	800	600	-	-	-	500	-	-	-	-	-	-
Subtotal e	3,000 f	1,525	2,807	2,906	4,200	13,046 f	9,216	8,268	5,625 f	6,610 f	6,428 f	9,267 f	6,500 f	7,560 f
Total	15,867	19,331	20,388	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,150

a 1961-1974 data available from 1981 Yukon Area Annual Management Report.
b Includes Shageluk catches.
c Includes catches by Fairbanks subsistence and personal use permit holders that fished in Yukon River near bridge crossing.
d Alatna combined with Allakaket.
e Combined Indian Food Fish and Domestic catch data by village obtained from annual management reports. Subtotals include revised catch data and summation of village catches may not equal subtotal.
f Catch by village not available.
g Personal use catches included (Mouth to Anuk River - 82; and Fairbanks - 557).

Appendix Table 28. Subsistence and commercial chinook salmon catches by district and country, Yukon River drainage, 1978-1988.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988 a
District 1											
Subsistence	5,246	2,879	3,669	2,282	2,311	6,263	4,624	3,071	5,275	7,278	4,020
Commercial	59,006	75,007	90,382	99,506	74,450	95,457	74,671	90,011	53,035	76,643	57,109
Subtotal	64,252	77,886	94,051	101,788	76,761	101,720	79,295	93,082	58,310	83,921	61,129
District 2											
Subsistence	3,964	4,268	3,674	3,580	2,109	9,065	7,172	3,468	6,483	9,866	3,823
Commercial	32,924	41,498	50,004	45,781	39,132	43,229	36,697	48,365	41,849	47,458	35,188
Subtotal	36,888	45,766	53,678	49,361	41,241	52,294	43,869	51,833	48,332	57,324	39,011
District 3											
Subsistence	3,902	3,263	4,783	4,001	3,359	4,910	4,394	3,342	4,252	4,661	4,443
Commercial	2,916	5,018	5,240	4,023	2,609	4,106	3,039	2,588	901	2,039	1,767
Subtotal	6,818	8,281	10,023	8,024	5,968	9,016	7,433	5,930	5,153	6,700	6,210
Lower Yukon Total											
Subsistence	13,112	10,410	12,126	9,863	7,779	20,238	16,190	9,881	16,010	21,805	12,286
Commercial	94,846	121,523	145,626	149,310	116,191	142,792	114,407	140,964	95,785	126,140	94,064
Total	107,958	131,933	157,752	159,173	123,970	163,030	130,597	150,845	111,795	147,945	106,350
District 4											
Subsistence b	5,549	7,265	11,088	4,442	5,077	9,754	7,650	7,425	9,583	7,961	9,619
Commercial	608	1,989	1,521	1,347	1,087	601	961	664	502	1,524	3,159
Subtotal	6,157	9,254	12,609	5,789	6,164	10,355	8,611	8,089	10,085	9,485	12,778
District 5											
Subsistence c	10,405	11,997	17,684	13,300	12,859	16,780	14,989	15,090	15,944	19,262	19,244
Commercial	3,079	3,389	4,891	6,374	5,385	3,606	3,669	3,418	2,733	3,758 d	3,436
Subtotal	13,484	15,386	22,575	19,674	18,244	20,386	18,658	18,508	18,677	23,020	22,680
District 6											
Subsistence	1,231	1,333	1,826	2,085	2,443	2,706	3,599	7,375	3,701	4,096	5,441
Commercial	635	772	1,947	987	981	911	867	1,142	950	3,338 e	762
Subtotal	1,866	2,105	3,773	3,072	3,424	3,617	4,466	8,517	4,651	7,434	6,203
Upper Yukon Total											
Subsistence	17,185	20,595	30,598	19,827	20,379	29,240	26,238	29,890	29,228	31,319	34,304
Commercial	4,322	6,150	8,359	8,708	7,453	5,118	5,497	5,224	4,185	8,620	7,357
Total	21,507	26,745	38,957	28,535	27,832	34,358	31,735	35,114	33,413	39,939	41,661
Alaska Totals											
Subsistence	30,297	31,005	42,724	29,690	28,158	49,478	42,428	39,771	45,238	53,124	46,590
Commercial	99,168	127,673	153,985	158,018	123,644	147,910	119,904	146,188	99,970	134,760	101,421
Total	129,465	158,678	196,709	187,708	151,802	197,388	162,332	185,959	145,208	187,884	148,011
Canada											
Subsistence f	2,906	4,200	13,046	9,216	8,268	5,625	6,610	6,428	9,267	6,500	7,560
Commercial	2,975	6,175	9,500	8,593	8,640	13,027	9,885	12,573	10,797	10,864	13,217
Total	5,881	10,375	22,546	17,809	16,908	18,652	16,495	19,001	20,064	17,364	20,777
U.S./Canada Totals											
Subsistence	33,203	35,205	55,770	38,906	36,426	55,103	49,038	46,199	54,505	59,624	54,150
Commercial	102,143	133,848	163,485	166,611	132,284	160,937	129,789	158,761	110,767	145,624	114,638
Totals	135,346	169,053	219,255	205,517	168,710	216,040	178,827	204,960	165,272	205,248	168,788

a Includes personal use catches (82 - District 1; 2,044 - District 5; 557 - District 6).
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Includes illegal sales of 653 chinook salmon in District 5.
e Includes illegal sales of 2,136 chinook salmon in District 6.
f Combined Indian Food Fish and Domestic harvests.

Appendix Table 29. Subsistence and commercial summer chum salmon catches by district, Yukon area, 1978-1988.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988 a
District 1											
Subsistence	30,897	16,144	15,972	11,310	18,452	24,679	28,459	24,349	38,854	30,760	29,439
Commercial	393,785	369,934	391,252	507,158	249,516	451,164	292,676	247,486	381,127	222,898	648,198
Subtotal	424,682	386,078	407,224	518,468	267,968	475,843	321,135	271,835	419,981	253,658	677,637
District 2											
Subsistence	21,684	23,276	13,681	14,218	18,442	27,396	26,996	19,795	41,496	33,134	28,787
Commercial	227,548	172,838	308,704	351,878	182,344	248,092	236,931	188,099	288,427	174,876	425,172
Subtotal	249,232	196,114	322,385	366,096	200,786	275,488	263,927	207,894	329,923	208,010	453,959
District 3											
Subsistence	1,706	2,946	3,242	4,929	5,840	4,609	7,351	3,687	5,528	4,161	5,830
Commercial	27,003	40,015	44,782	54,471	4,086	14,600	1,087	1,792	442	3,501	13,965
Subtotal	28,709	42,961	48,024	59,400	9,926	19,209	8,438	5,479	5,970	7,662	19,795
Lower Yukon Total											
Subsistence	54,287	42,366	32,895	30,457	42,734	56,684	62,806	47,831	85,878	68,055	64,056
Commercial	648,336	582,787	744,738	913,507	435,946	713,856	530,694	437,377	669,996	401,275	1,087,335
Total	702,623	625,153	777,633	943,964	478,680	770,540	593,500	485,208	755,874	469,330	1,151,391
District 4											
Subsistence b	110,059	123,740	221,201	139,572	199,985	136,045	112,965	165,383	166,072	157,406	202,185
Commercial c	381,104	204,747	234,837	241,826	120,513	166,056	221,964	321,939	359,193	109,320	383,273 d
Subtotal	491,163	328,487	456,038	381,398	320,498	302,101	334,929	487,322	525,265	266,726	585,458
District 5											
Subsistence e	21,028	23,878	8,594	27,308	9,791	23,943	31,535	26,996	21,833	24,850	30,650
Commercial f	4,892	8,608	456	1,236	213	42	645	700	690	362	722
Subtotal	25,920	32,486	9,050	28,544	10,004	23,985	32,180	27,696	22,523	25,212	31,372
District 6											
Subsistence	11,770	6,203	9,708	10,947	8,459	23,714	23,441	24,618	17,042	25,603	12,047
Commercial f	34,814	18,491	35,855	32,477	21,597	24,309	56,249	66,913	50,483	10,610	40,129
Subtotal	46,584	24,694	45,563	43,424	30,056	48,023	79,690	91,531	67,525	36,213	52,176
Total Upper Yukon											
Subsistence	142,857	153,821	239,503	177,827	218,235	183,702	167,941	216,997	204,947	207,859	244,882
Commercial	420,810	231,846	271,148	275,539	142,323	190,407	278,858	389,552	410,366	120,292	424,124
Total	563,667	385,667	510,651	453,366	360,558	374,109	446,799	606,549	615,313	328,151	669,006
Alaska Total											
Subsistence	197,144	196,187	272,398	208,284	260,969	240,386	230,747	264,828	290,825	275,914	308,938
Commercial	1,069,146	814,633	1,015,886	1,189,046	578,269	904,263	809,552	826,929	1,080,362	521,567	1,511,459
Total	1,266,290	1,010,820	1,288,284	1,397,330	839,238	1,144,649	1,040,299	1,091,757	1,371,187	797,481	1,820,397

a Includes personal use catches (505 - District 1; 1,327 - District 5; and 1,715 District 6).
b Includes Koyukuk and Innoko River drainages.
c In 1986, 80.2% of the reported subsistence harvest in District 4 (excluding Koyukuk and Innoko River catches) was estimated to have been taken during commercial fishing activities. This relationship was used to adjust total estimated commercial related harvests from Appendix Table 6 for 1980-1987.
d A total of 106,801 fish from the commercial related harvest documented as subsistence use were included as subsistence.
e Includes Chandalar and Black River drainages.
f Harvest of females for commercial roe sales believed to be reported as subsistence.

Appendix Table 30. Subsistence and commercial fall chum salmon catches by district and country, Yukon River drainage, 1978-1988.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988 a
District 1											
Subsistence	390	15,788	7,433	15,540	10,016	8,238	8,885	13,275	9,000	18,467	5,482
Commercial	127,947	109,406	106,829	167,834	97,484	124,371	78,751	129,948	59,352	0	45,529
Subtotal	128,337	125,194	114,262	183,374	107,500	132,609	87,636	143,223	68,352	18,467	51,011
District 2											
Subsistence	1,297	14,662	12,435	11,770	9,511	10,341	11,394	11,544	13,483	13,454	8,600
Commercial	51,646	94,042	83,881	154,883	96,581	85,645	70,803	40,490	51,307	0	31,861
Subtotal	52,943	108,704	96,316	166,653	106,092	95,986	82,197	52,034	64,790	13,454	40,461
District 3											
Subsistence	266	2,443	2,320	2,893	1,659	2,863	2,233	2,290	1,785	2,853	1,747
Commercial	11,527	25,955	13,519	19,043	5,815	10,018	6,429	5,164	2,793	0	2,090
Subtotal	11,793	28,398	15,839	21,936	7,474	12,881	8,662	7,454	4,578	2,853	3,837
Lower Yukon Total											
Subsistence	1,953	32,893	22,188	30,203	21,186	21,442	22,512	27,109	24,268	34,774	15,829
Commercial	191,120	229,403	204,229	341,760	199,880	220,034	155,983	175,602	113,452	0	79,480
Total	193,073	262,296	226,417	371,963	221,066	241,476	178,495	202,711	137,720	34,774	95,309
District 4											
Subsistence b	10,652	37,896	23,675	20,123	20,319	34,209	31,152	25,275	26,496	41,901	18,379
Commercial d	10,988	48,899	27,978	12,082	3,894	4,482	7,625	24,452	2,045	0	15,662
Subtotal	21,640	86,795	51,653	32,205	24,213	38,691	38,777	49,727	28,541	41,901	34,041
District 5											
Subsistence c	51,705	110,792	76,466	111,567	71,828	105,103	98,433	117,125	88,124	157,085 e	86,862
Commercial d	21,016	47,459	41,771	86,620	13,593	43,993	24,060	25,338	22,053	0	16,989
Subtotal	72,721	158,251	118,237	198,187	85,421	149,096	122,493	142,463	110,177	157,085	103,851
District 6											
Subsistence	30,557	51,766	50,328	26,632	19,564	32,174	22,726	36,963	25,155	127,903 f	38,633
Commercial d	13,259	34,185	19,452	25,989	6,820	34,089	20,564	42,352	1,892	0	48,832 g
Subtotal	43,816	85,951	69,780	52,621	26,384	66,263	43,290	79,315	27,047	127,903	87,465
Upper Yukon Total											
Subsistence	92,914	200,454	150,469	158,322	111,711	171,486	152,311	179,363	139,775	326,889	143,874
Commercial	45,263	130,543	89,201	124,691	24,307	82,564	52,249	92,142	25,990	0	81,483
Total	138,177	330,997	239,670	283,013	136,018	254,050	204,560	271,505	165,765	326,889	225,357
Alaska Totals											
Subsistence	94,867	233,347	172,657	188,525	132,897	192,928	174,823	206,472	164,043	361,663	159,703
Commercial	236,383	359,946	293,430	466,451	224,187	302,598	208,232	267,744	139,442	0	160,963
Total	331,250	593,293	466,087	654,976	357,084	495,526	383,055	474,216	303,485	361,663	320,666
Canada Totals											
Subsistence h	6,210	13,000	13,218	7,021	4,779	3,500	6,335	5,519	3,072	3,889	3,302
Commercial	3,356	9,084	9,000	15,260	11,312	25,990	22,932	35,746	11,464	40,591	30,263
Total	9,566	22,084	22,218	22,281	16,091	29,490	29,267	41,265	14,536	44,480	33,565
Yukon River drainage Totals											
Subsistence	101,077	246,347	185,875	195,546	137,676	196,428	181,158	211,991	167,115	365,552	163,005
Commercial	239,739	369,030	302,430	481,711	235,499	328,588	231,164	303,490	150,906	40,591	191,226
Total	340,816	615,377	488,305	677,257	373,175	525,016	412,322	515,481	318,021	406,143	354,231

a Includes personal use catches (7 - District 1; 2,653 - District 5; 2,230 - District 6).
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Harvest of females for commercial roe sales believed to be reported as subsistence.
e Includes illegal sales involving an estimated 95,768 fall chum salmon.
f Includes illegal sales involving an estimated 119,168 fall chum salmon.
g Includes 26,988 fall chum salmon sold as part of a new test fishing project.
h Combined Indian Food Fish and Domestic harvests.

Appendix Table 31. Subsistence and commercial coho salmon catches by district, Yukon area, 1978-1988.

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988 a
District 1											
Subsistence	1,142	3,184	1,808	3,769	11,192	3,590	6,095	3,246	2,725	6,396	4,389
Commercial	16,460	11,369	4,829	13,129	15,115	4,595	29,472	27,676	24,824	0	36,435
Subtotal	17,602	14,553	6,637	16,898	26,307	8,185	35,567	30,922	27,549	6,396	40,824
District 2											
Subsistence	598	1,132	4,801	3,736	10,229	6,072	7,066	4,834	9,140	6,894	7,104
Commercial	5,835	2,850	2,660	7,848	14,179	2,557	43,064	17,125	21,197	0	34,776
Subtotal	6,433	3,982	7,461	11,584	24,408	8,629	50,130	21,959	30,337	6,894	41,880
District 3											
Subsistence	223	12	91	490	675	917	740	376	781	682	1,539
Commercial	758	0	0	419	87	0	621	171	793	0	1,419
Subtotal	981	12	91	909	762	917	1,361	547	1,574	682	2,958
Lower Yukon Total											
Subsistence	1,963	4,328	6,700	7,995	22,096	10,579	13,901	8,456	12,646	13,972	13,032
Commercial	23,053	14,219	7,489	21,396	29,381	7,152	73,157	44,972	46,814	0	72,630
Total	25,016	18,547	14,189	29,391	51,477	17,731	87,058	53,428	59,460	13,972	85,662
District 4											
Subsistence b	145	259	7,734	2,259	2,952	3,946	2,867	3,949	2,631	3,551	4,842
Commercial	32	155	30	0	15	0	1,095	938	0	0	2
Subtotal	177	414	7,764	2,259	2,967	3,946	3,962	4,887	2,631	3,551	4,844
District 5											
Subsistence c	970	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900 d	19,755
Commercial	1	0	0	0	0	0	0	0	0	0	8
Subtotal	971	595	561	1,713	3,428	2,448	17,467	8,098	5,870	11,900	19,763
District 6											
Subsistence	4,709	4,612	5,163	9,261	7,418	6,922	14,785	11,761	13,321	55,471 e	31,509
Commercial	3,066	2,791	1,226	2,284	7,780	6,168	7,688	11,762	441	0	27,267 f
Subtotal	7,775	7,403	6,389	11,545	15,198	13,090	22,473	23,523	13,762	55,471	58,776
Upper Yukon Total											
Subsistence	5,824	5,466	13,458	13,233	13,798	13,316	35,119	23,808	21,822	70,922	56,106
Commercial	3,099	2,946	1,256	2,284	7,795	6,168	8,783	12,700	441	0	27,277 f
Total	8,923	8,412	14,714	15,517	21,593	19,484	43,902	36,508	22,263	70,922	83,383 f
Area Total											
Subsistence	7,787	9,794	20,158	21,228	35,894	23,895	49,020	32,264	34,468	84,894	69,138
Commercial	26,152	17,165	8,745	23,680	37,176	13,320	81,940	57,672	47,255	0	99,907 f
Total	33,939	26,959	28,903	44,908	73,070	37,215	130,960	89,936	81,723	84,894	169,045 f

a Includes personal use catches of 1,308 coho salmon in District 6.
b Includes Innoko and Koyukuk River drainages.
c Includes Chandalar and Black River drainages.
d Includes illegal sales involving an estimated 11,840 coho salmon.
e Includes illegal sales involving an estimated 52,335 coho salmon.
f Includes 13,295 coho salmon sold as part of a new test fishing project in District 6.

Appendix Table 32. Subsistence and personal use salmon catches taken under authority of a permit, Upper Yukon area, 1973-1988.

Upper Tanana River (upstream of Wood River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Summer Chum	Fall Chum and coho
1973	22	4	26	771	886
1974	70	b	38	1,373	1,580
1975	36	b	32	751	864
1976	110	b	31	1,314	1,512
1977	89	33	81	118	607
1978	160	126	126	2,729	1,188
1979	246	199	264	2,384	4,459
1980	315	254	282	3,729	4,059
1981	346	228	440	3,239	5,770
1982	330	209	451	2,708	4,521
1983	259	147	475	2,276	3,830
1984	308	212	321	3,177	5,134
1985	291	155	326	2,646	3,937
1986	323	211	637	4,031	4,437
1987 c	289	183	531	2,739	5,781
1988 d	210	114	557	1,715	3,538

Upper Tanana River (Big Delta area) subsistence chum salmon carcass fishery

Year	No. of Permits Issued	No. Reporting Catches	Fall Chum Carcasses
1973	16	8	1,561
1974	21	b	1,974
1975	26	b	2,573
1976	36	b	3,441
1977	46	29	5,816
1978	70	43	2,517
1979	32	25	4,582
1980	57	36	4,915
1981	43	27	5,030
1982	37	13	1,690
1983	45	29	5,357
1984	31	14	2,353
1985	30	14	2,111
1986	27	19	2,276
1987 c	20	11	1,651
1988 d	22	19	2,150

Upper Yukon River (Hess Creek to Dall River) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Chum	Coho
1974	29	b	591	1,857	1,271
1975	19	b	727	778	70
1976	28	18	531	974	-
1977	38	b	467	2,567	-
1978	57	b	1,333	9,735	-
1979	55	41	2,194	12,374	-
1980	70	67	1,350	6,488	36
1981	57	24	1,095	12,034	-
1982	64	44	1,935	11,328	20
1983	68	46	2,672	15,059	-
1984	67	54	4,676	27,869	399
1985	55	42	2,618	21,832	33
1986	76	58	3,827	18,690	759
1987 c	58	47	3,492	29,734	64
1988 d	58	39	2,044	3,980	0

Upper Yukon R. (22 Mi Slough to U.S./Canada border) subsistence salmon fishery

Year	No. of Permits Issued	No. Reporting Catches a	Chinook	Chum	Coho
1979	75	60	4,063	30,475	114
1980	48	39	3,649	18,477	6
1981	71	51	4,510	38,333	-
1982	60	61	3,833	15,432	-
1983	53	52	2,831	23,708	-
1984	58	54	2,543	21,675	17
1985	59	36	2,419	19,059	2
1986	40	52	4,148	20,701	43
1987	53	60	3,634	29,864	0
1988	39	33	2,333	16,073	11

a Some fishermen reporting catches did not have permits.
b Information not available.
c Personal use fishery established only for fall chum salmon in 1987.
d Personal use catches (fishery established for all salmon in 1988).

Appendix Table 33. Comparative Yukon River chinook salmon escapement estimates, 1975-1988. a

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Andreafsky River														
East Fork	993	818	2,008	2,487	1,180	958 b	2,146 c	1,274	2,720 d	2,473 d	1,617	1,954	1,608 p	1,020 u
West Fork	301	643	1,499	1,062	1,134	1,500	231 b	851	--	1,993	2,248	3,158	3,281	1,448
Total	1,294	1,461	3,507	3,549	2,314	2,458	2,377 b	2,125	2,720 b	4,466	3,865	5,112	4,889	2,468
Anvik River Drainage														
Tower Count	548	958	1,261	1,088	1,247	--	--	--	--	--	--	--	--	--
Below Tower Site (incl trib)	182 e	195 e,f	110	236	237	--	--	--	--	--	--	--	--	--
Total	730	1,153	1,371	1,324	1,484	1,330	807 b	--	653 b	641 b	1,051	1,118	1,174 b	1,805
Mulato River														
North Fork (incl main river)	123	471	286	498	1,093	954	--	--	526	--	1,600	1,452	1,145	1,061
South Fork	81	177	201	422	414	369	791	--	480	--	1,180	1,522	493	714
Total	204	648	487	920	1,507	1,323	791 b	--	1,006 b	--	2,780	2,974	1,638	1,775
Gisasa River	385	332	255	45 b	484	951	--	421	572	--	735	1,346	731	797
Tozitna River	202	42 b	123	194	--	257	--	51	388	--	86	222	--	116
Chena River	316 e	531	563	1,726	1,159	2,541	600 b	2,073	2,553	501	2,553	2,031 g	1,312 q	1,966 v
Salcha River	1,055	1,641	1,202	3,499	4,789	6,757	1,237 b	2,534	1,961	1,031	2,035	3,368	1,898 r	2,764 w
Tatchun Creek h,i	175 j	52 j	150 j	200 e,j	150 j	222 j	133 j	73 j	264 j	161	190	155 j	159 j	130 j
Little Salmon River h	--	--	171	330	489 b	286 b	670	403	101 b	434	255 j	54 b,j	468 j	368 j
Big Salmon River h														
Big Salmon Lk - Scurvy Cr	153	--	--	--	555	470	930	174	189	228	202	306	379	111
Scurvy Cr - vicinity South Cr	--	--	--	--	77	966	1,481	584	351	816	599	439	512	654
Total	153 b	86 b	316 b	524 b	632	1,436	2,411	758	540	1,044	801	745 k	891 s	765 x
Nisutlin River Drainage h														
Sidney Cr - 100 Mile Cr	249	102	77	375	713	975	1,626	578	701	832	409	459 b	275	267
McNeil Ri - Nisutlin Lk	88	50	--	109	--	400	168	97	107	222	96	148	38	143
Wolf Ri (Wolf Lk - Red Ri)	40 b,j	--	--	--	183 b	377 j	395	104	95	124	110	109	35	66
Total	377 b	152 b	77 b	484 b	896 b	1,752	2,189	779	903	1,178	615	716	348	476
Whitehorse Dam (Fishway Counts) h	313	121	277	725	1,184	1,335	1,539	473	905	1,042 l	536 m	541 n	327 t	405 y
Canadian Yukon Mainstem (Tagging) o	--	--	--	--	--	--	--	19,790	28,989	--	10,730	16,415	13,210	22,259

a Data obatained from aerial surveys unless otherwise indicated. Only peak estimates are listed.
b Incomplete or poor survey conditions resulting in a very minimal count.
c Bendix sonar estimate was 5,343 chinook salmon.
d Bendix side scan sonar estimate.
e Boat survey.
f Also includes 93 chinook observed in the Yellow River.
g Peterson population estimate was 9,065 chinook salmon.
h Yukon Territory streams.
i Foot survey.
j Canadian (DFO) data.
k The DFO weir count was 1,816 chinook salmon.
l Includes 65 chinook salmon taken for hatchery brood stock.
m Includes 98 chinook salmon taken for hatchery brood stock.
n Includes 150 chinook salmon taken for hatchery brood stock of which 90 died.
o Estimated spawning escapement to Canada (excluding Porcupine R.) from DFO tagging project.
p Tower count was 2,011 chinook salmon.
q Petersen population estimate was 6,404 chinook salmon.
r Petersen population estimate was 4,771 chinook salmon.
s The DFO weir count was 998 chinook salmon.
t Includes approximately 100 chinook salmon taken for hatchery brood stock.
u Tower count was 1,339 chinook salmon.
v Petersen population estimate not yet available.
w Petersen population estimate was 4,562 chinook salmon.
x DFO partial weir count (due to high water) was 344 chinook salmon.
y Includes 134 chinook salmon taken for hatchery brood stock.

Appendix Table 34. Comparative Yukon River summer chum salmon escapement estimates 1975-1988. a

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Andreafsky River														
East Fork	223,485	105,347	112,722	127,050	66,471	36,623 b	81,555 c	7,501 b,d	110,608 e	70,125 e	66,146	167,614 f	45,221 f	68,937 f
West Fork	235,954	118,420	63,120	57,321	43,391	115,457	--	7,267	--	238,565	52,750	99,373	31,998	45,432
Total	459,439	223,767	175,842	184,371	109,862	152,280	--	14,768 b	--	308,690	118,896	266,987	77,219	114,369
Anvik River Drainage														
Tower Count	601,880	237,851	162,614	166,102	37,457	--	--	--	--	--	--	--	--	--
Below Tower Site g	211,130	168,315	100,240	85,237	--	--	--	--	--	--	--	--	--	--
Above Tower Site g	634,355	243,695	--		84,620	--	--	--	--	--	--	--	--	--
Subtotal	845,485	412,010	100,240	85,237	--	--	--	--	--	--	--	--	--	--
Total	845,485	406,166	262,854	251,339	280,537 e,h	492,676 e	1,479,582 e	444,581 e	362,912 e	891,028 e	1,080,243 e	1,189,602 e	455,876 e	1,125,449 e
Rodo River	25,355	38,258	16,118	17,845	--	--	--	--	--	--	24,576	--	--	13,872
Nulato River														
North Fork (incl mainstem)	87,280	30,771	58,275	41,659	35,598	11,244 b	--	--	19,749	--	19,344	47,417	7,163	26,951
South Fork	51,215	9,230 b	11,385	12,821	1,506	3,702 b	14,348	--	1,263 i	--	10,494	16,848	4,094	15,132
(best estimate) Total	138,495	40,001	69,660	54,480	37,104	14,946 b	--	--	21,012 b	--	29,838	64,265	11,257	42,083
Gisasa River	56,904	21,342	2,204 b	9,280 b	10,962	10,388	--	334 j	2,356 b	--	13,232	12,114	2,123	9,284
Nogatza River														
Clear Creek	7,610	9,356	6,437	2,716	5,132	12,375	--	4,198 j	14,051	--	8,072	--	2,725 l	2,870
Caribou Creek	14,745	11,388	4,297	2,386	9,089	7,411	--	786 j	14,090	--	14,494	--	2,944 l	4,020
Total	22,355	20,744	10,734	5,102	14,221	19,786	--	4,984 b	28,141	--	22,566	--	5,669	6,890
Tozitna River	3,512	725 b	761	2,262	--	580	--	874	1,604	--	1,030	1,778	--	2,983
Chena River	2,380 k	685	610	1,609	1,025 b	338	3,500	1,509	1,097	1,861	1,005	1,509	333	432
Salcha River	7,573	6,484	677	5,405	3,060	4,140	8,500	3,756	716	9,810	3,178	8,028	3,657	2,889

a Data are peak aerial survey estimates rated fair to good unless indicated otherwise.
b Incomplete or poor survey conditions resulting in minimal count.
c Sonar estimate was 147,312.
d Sonar estimate was 180,078.
e Bendix side scan sonar estimate.
f Tower count.
g Includes tributaries
h Count includes 277,712 sonar estimate plus 2,825 below sonar site.
i Surveyed too early.
j Surveyed too late.
k Boat survey.
l Surveyed too late resulting in low count.

Appendix Table 35. Comparative Yukon River fall chum salmon escapement estimates to selected index areas, 1975-1988. a

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
TANANA RIVER DRAINAGE														
Upper Toklat River b	42,418 c	35,190	21,800 c	35,000	96,550 d	23,054	13,907	3,309 e	15,105 e	15,861	21,824 d	12,708 d,t	18,350 d,u	10,786 d,w
Lower Toklat River	35,867 c	(2,000) d	--	--	64,540	(2,140)	--	--	--	--	--	--	2,220	--
Upper Tanana River														
Benchmark #735 Slough	--	336	1,270	1,705 c	2,714	1,900 e	168 c	--	--	--	1,093	--	--	20
Delta River	3,734 h	6,312 h	16,876 h	10,051	8,125	4,637	22,375 e,g	3,433 e	7,230 e	12,327 e	17,276 h	6,703 h	21,180 h	18,024 h
South Bank Tanana i	--	4,979	3,797	5,700	20,820	3,444	7,063	--	1,350 c	2,150	975 c	1,610 c	--	7,000
Bluff Cabin Slough	5,000 c,d	3,197	6,491	5,340	6,875	3,190	6,120	1,156 e	12,715 e	4,017 e	2,655	3,458 e	9,395 e	4,481 e
One Mile Slough	745 d	1,552	1,900	475	3,850 c	885 c	632	--	1,115 c	560 c	366 c	1,949	2,500 e,v	1,520 e
Subtotal	9,479 j	16,376	30,334	23,271	42,384	14,056	36,358	4,589 j	22,410 j	19,054 j	22,365	13,720 j	33,075 j	31,045 j
Total Tanana Index	87,764 j	51,566	52,134	58,271	203,474	37,110	50,265	7,898 j	37,515 j	34,915 j	44,189	26,428	53,645 j	41,831 j
CHANDALAR RIVER	6,345 c,j	58 c,j	4,183	--	--	2,607	4,906 o,j	1,145 o	--	--	2,535 p	59,313 p,l	52,416 p,l	33,619 p,l
PORCUPINE RIVER DRAINAGE														
Sheenjek River	78,060	11,866	20,506	14,610 c	41,140	13,027	74,560 l	31,421 l	49,392 l	27,130 l	152,768 l	83,197 l	140,086 l	45,000 l,r
Fishing Branch River (YT)	353,282 m	13,450	32,500	15,000	44,080	20,319 c	10,549 j	5,846	10,000	5,570	56,016 m	31,173 m,r	48,956 m	23,597 m,r
Total Porcupine River	431,342 n	25,316	53,006	29,610	85,220	33,346	85,109 n	37,267 n	59,392 n	32,700 n	208,784 n	114,370 n	189,042 n	68,597 n
UPPER YUKON TRIBUTARIES														
Kluane River (YT)	362 e,f	20 f	3,555	0 f	4,640 e	3,150	25,806	5,378 e	8,578 e,j	7,200	7,538	16,686	12,000	6,950
Yukon River (YT) q	7,671	--	--	--	--	--	250 j	1,020	7,560	2,800	10,760	825	6,115	1,550
Total Yukon (YT)	8,033	20	3,555	0	4,640	3,150	26,056	6,398	16,138	10,000	18,298	17,511	18,115	8,500
Mainstem Yukon Canada (Tagging) s	--	--	--	--	--	--	--	31,958	90,875	--	62,010	87,990	80,776	35,588

a Data are peak aerial survey estimates rated fair to good unless otherwise indicated.
b Includes following areas: Toklat River in vicinity of Knights Roadhouse; Sushana River; Geiger Creek. Lower Toklat River counts are included in Total Tanana River Index for years 1975, 1979 and 1987.
c Poor survey.
d Combined aerial and ground surveys.
e Ground surveys.
f Survey rating not given.
g Peak aerial count was 10,664.
h Population estimate based upon replicate ground surveys.
i Richardson Highway to Blue Creek
j Incomplete, partial survey of index area(s).
l Bendix side scan sonar estimate. (For Sheenjek River -- includes expansion for uninsonified mid-river zone).
m Weir counts.
n Figure includes sonar or weir estimate and is not comparable on a year to year basis.
o Fair to poor survey rating.
p USFWS estimates.
q Vicinity of Ft Selkirk to Carmacks.
r Preliminary.
s Estimated total spawning escapement to Canada (excluding Porcupine River) from DFO tagging project.
t Population estimate for upper Toklat River area was 18,903 fall chum salmon.
u Population estimate for upper Toklat River area was 22,141 fall chum salmon.
v These fish were observed in lower one mile of Delta Clearwater River (One Mile Slough not surveyed).
w Population estimate for upper Toklat River area was 13,324 fall chum salmon.

Appendix Table 36. Comparative Yukon River coho salmon escapement estimates, 1977-1988. a

	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988
Nenana River												
Lost Slough	524	350	227	499	274	--	766	2,677	1,584	794	2,511	348
Clear Creek	--	--	--	--	--	--	--	2,600 b,c	--	605 b,c	--	--
Wood Creek b	310 d	300 d	--	1,603 d	849 e	1,436 e	1,044 e	8,805 e	3,775 e	1,664 e	2,450 e	2,046 e
Seventeen Mile Slough	1,167	466	1,987	592	1,005	--	103	--	2,081	218 b,c	3,802	--
Subtotal Nenana River	2,001	1,116	2,214	2,694	2,128	1,436	1,913	14,082	7,440	3,281	8,763	2,394
Delta Clearwater River c,f	4,793	4,798	8,970	3,946	8,563 g	8,365 g	8,019 g	11,061	5,358	10,857	22,300	21,600
Clearwater Lake and outlet	730 c,f	570 c,f	1,015 c,f	1,545 c,f	459 h	--	253	1,368	750	3,577	4,225 c,f	825 c,f
Richardson Clearwater River	327	--	372	611	550	--	88	428	--	146 h	--	--

a Peak aerial survey estimates rated fair to good unless otherwise indicated.
b F.R.E.D. Division data.
c Boat survey.
d Foot survey.
e Weir count
f Sport Fish Division survey
g Population estimate.
h Poor or incomplete survey.

Appendix Table 37. Percent of catch by age for salmon in Yukon River commercial and subsistence harvests, 1982-1988. a

Species	Year	Sample Size	Age 3	4	5	6	7	8	Total
Chinook	1982	3,795	0.2	6.8	18.5	58.3	15.9	0.3	100.0
Salmon	1983	3,801	0.0	6.6	21.0	62.9	9.4	0.0	100.0
	1984	3,700	0.0	3.7	27.0	56.0	13.1	0.1	100.0
	1985	4,567	0.1	5.7	13.2	69.4	11.3	0.3	100.0
	1986	5,785	0.3	3.9	27.2	42.8	25.1	0.6	100.0
	1987	5,300	0.0	4.2	8.4	72.5	14.5	0.3	100.0
	1988	5,108	0.1	14.8	22.8	31.5	29.4	1.4	100.0
Summer	1982	3,419	2.0	61.2	34.4	2.4			100.0
Chum	1983	4,110	1.0	53.8	44.4	0.8			100.0
Salmon	1984	2,722	2.0	73.7	23.9	0.5			100.0
	1985	2,472	1.4	68.6	29.2	0.8			100.0
	1986	3,473	0.1	29.1	69.8	1.0			100.0
	1987	2,184	0.4	60.8	31.8	6.9	0.0		100.0
	1988	5,112	0.0	70.1	29.1	0.8			100.0
Fall	1982	2,918	6.5	58.6	34.5	0.3			100.0
Chum	1983	1,735	0.7	91.4	8.0	0.0			100.0
Salmon	1984	1,902	6.6	55.6	37.5	0.4			100.0
	1985	2,801	5.2	83.4	11.0	0.4	0.0		100.0
	1986	1,715	7.4	89.6	2.5	0.5			100.0
	1987	1,513	5.0	77.1	17.5	0.4	0.0		100.0
	1988	4,030	4.1	45.7	46.6	3.5	0.0		100.0
Coho	1982	320	4.1	87.3	8.6				100.0
Salmon	1983	121	4.1	91.7	4.1				100.0
	1984	619	12.9	73.7	13.4				100.0
	1985	462	14.1	76.3	9.6				100.0
	1986	491	2.2	88.6	9.2				100.0
	1987	0							0.0
	1988	1,091	12.2	85.5	2.3				100.0

a Age composition estimated from samples collected from each gear type, by district and fishery, or from samples from adjacent fisheries of the same gear type. Fisheries for which no appropriate samples were available were not apportioned to age.

Appendix Table 38. Associated environmental and salmon catch data, Yukon River, 1961-1988.

Year	Average Nome April Air Temp. (F)	Tanana River Nenana Ice Breakup	Iceout Yukon Delta Area	First Chinook Caught Delta Area b	First Chinook Caught Kuskokwim River b	First Chinook Caught Dist. 1 Comm. Fishery	First Summer Chum Caught Delta Area b	First Summer Chum Caught Dist. 1 Comm. Fishery
1961	18	5/05	a	6/05	a	6/05	a	-
1962	18	5/12	6/10	6/07 c	a	6/11	a	-
1963	18	5/05	5/29	a	a	6/03	a	-
1964	13	5/20	>6/12	a	a	6/15	a	-
1965	20	5/07	6/01	6/06	5/31	6/07	a	-
1966	15	5/08	6/06	6/09	5/27 g	6/10	a	-
1967	23	5/04	a	5/20	5/20	6/02	5/30	6/09
1968	14	5/08	a	a	5/26	6/03	6/05	6/07
1969	22	4/28	5/25	5/26	5/23	6/02	6/02	6/02
1970	15	5/04	late May	6/06	5/21	6/06	6/05	6/11
1971	13	5/08	6/05	6/11	6/06	6/11	6/15	6/15
1972	12	5/10	6/03	6/09	6/05	6/09	6/11	6/10
1973	18	5/04	6/01	5/30 d	5/27	6/05	6/05	6/07
1974	21	5/06	late May	5/27	5/23	6/03	6/01	6/03
1975	13	5/10	6/01	6/01	5/26	6/09	6/13	6/13
1976	10	5/02	6/01	6/12	6/01	6/14	6/13	6/14
1977	9	5/06	6/01	6/09	5/31	6/11	6/11	6/13
1978	25	4/30	5/20	5/26	5/18	6/08	5/26	6/08
1979	26	4/30	5/20	5/24	5/16	6/04	5/28	6/04
1980	24	4/29	5/19	5/27 e	5/17	6/09	5/31	6/09
1981	24	4/30	5/18	5/25	5/22	6/05	5/28	6/05
1982	12	5/10	6/02	6/06	6/01	6/14	6/06	6/14
1983	25	4/29	5/21	5/25	5/23	6/09	5/30	6/09
1984	12	5/09	6/01	6/02 f	5/25	6/18	6/08	6/08
1985	1	5/11	6/05	6/14	6/03	6/24	6/16	6/24
1986	12	5/08	6/01	6/06	5/29	6/14 h	6/07	6/14
1987	19	5/05	5/31	5/31	5/24	6/15	6/04	6/15
1988	23	4/27	5/20	5/27	5/16	6/09 h	5/27	6/09

a Information not available.
b Subsistence or test net fishery.
c Caught 6/09 Mt. Village, back calculated arrival date to mouth.
d Caught 6/03 Pilot Station, back calculated arrival date to mouth.
e Caught 5/23 Marshall, back calculated arrival date to mouth.
f Caught 6/05 Pitkas Point, back calculated arrival date to mouth.
g Caught 6/01 Kalskag, back calculated arrival date to mouth.
h Special six inch maximum mesh size fishing period.

Appendix Table 39. Total catch and estimated catch of Western Alaska (including Canadian Yukon) chinook salmon (in thousands of fish) taken in Japanese high seas salmon gill net fisheries and total catch of chinook salmon taken in foreign and joint-venture trawl fisheries, 1964-1988.

	Japanese Mothership Gillnet		Japanese Landbased Driftnet		Japanese Total Gillnet		Bering Sea-Aleutian Area Trawl			Gulf of Alaska Trawl		
	Western Alaska		Western Alaska		Western Alaska			Joint			Joint	
Year	Origin	Total	Origin	Total	Origin	Total	Foreign	Venture	Total	Foreign	Venture	Total
1964	179	410	40	208	219	618						
1965	106	185	20	102	126	287						
1966	108	208	22	118	130	326						
1967	71	128	22	115	93	243						
1968	244	362	18	97	262	459						
1969	367	554	17	88	384	642						
1970	312	437	28	148	340	585						
1971	132	206	27	139	159	345						
1972	189	261	20	107	209	368						
1973	56	119	31	165	87	284						
1974	208	361	36	188	244	549						
1975	108	162	20	137	128	299						
1976	117	285	42	201	159	486						
1977	55	93	31	146	86	239				4.8		4.8
1978	36	105	63	210	99	315	39.1		39.1	a		
1979	69	126	45	160	114	286	100.4		100.4	16.9	1.0	17.9
1980	416	704	22	160	438	864	113.2	1.9	115.1	31.6	0.2	31.8
1981	30	88	55	190	85	278	36.7	0.3	37.0	28.6	0.0	28.6
1982	45	107	41	165	86	272	13.9	1.7	15.6	a	3.5	5.9
1983	31	87	44	178	75	265	9.8	0.5	10.3	5.9	9.4	9.4
1984	36	82	21	92	57	174	a	a	b	11.1	63.2	74.3
1985	25	66	22	101	47	167	b	b	b	0.3	13.6	13.6
1986	24	60	20	77	44	137	0.3	4.0 c	4.3	d	18.0	18.0
1987	20	39	b	77	b	116	b	b	b	d	b	b
1988	b	26	b	47	b	73	d	b	b	d	b	b

a Species composition unknown.
b Information not available.
c Longline harvest only, no trawling conducted in 1986.
d No fishing.

Appendix Table 40. Commercial herring fishing data, Cape Romanzof District, 1980-1988.

	1980	1981	1982	1983 a	1984	1985	1986	1987	1988
Catch (st)	611	720	657	816	1,185	1,299	1,865	1,342	1,119
Hours Fished	326	120	180	144	90	60	42	8	11
Percent Roe Recovery	9.8	8.0	9.3	9.0	8.6	8.3	9.2	8.9	9.1
Estimated Value ($ millions)	0.13	0.21	0.22	0.37	0.31	0.55	1.14	1.00	1.02
Number of Buyers	2	4	2	3	3	2	5	9	6
Number of Fishermen	69	111	75	63	66	73	97	157	113
% Effort by Local Fishermen	70	81	85	92	98.5	91	84	53	63
% Harvest by Local Fishermen	40	60	84	88	99.8	94	70	33	60
Biomass Estimate b	3,000	4,900	4,900	5,500	6,100	7,000	7,500	7,200	6,600
Exploitation Rate	20.4	14.7	13.4	14.8	19.4	18.6	24.9	18.6	17.0

a Exclusive Use Regulation into effect.
b Biomass estimates from 1980 to 1986 were qualitative estimates of herring abundance to describe abundance trends. Biomass estimate for 1987 was by aerial survey.

Appendix Table 41. Subsistence herring harvest (st) and effort data, Cape Romanzof, 1975-1988. a

Year	Scammon Bay	Chevak	Hooper Bay	Total	Number of Fishing Families
1975	-	-	3	3	34
1976	1	1	3	5	41
1977	-	<1	2	<3	30
1978	1	-	4	5	29
1979	6	2	3	11	84
1980	3	4	4	11	61
1981	8	2	4	14	46
1982	4	2	5	11	43
1983	3	1	5	9	37
1984	4	3	4	11	47
1985	2	2	4	8	44
1986	2	1	4	7	41
1987	1	1	1	3	39
1988	2	2	3	7	30

a Subsistence survey results are believed to accurately reflect harvest trends, however, reported catches reflect minimum figures since all fishermen cannot be contacted.

Appendix Table 42. Colville River commercial whitefish catches, 1964-1988.

Year	Broad Whitefish	Humpback Whitefish	Arctic Cisco ("kaktok")	Least Cisco ("herring")
1964	2,951 a		16,000	9,000
1965	3,000 a		50,000	
1966	2,500 a		40,000	
1967	data not available			
1968	3,130		42,055	18,180
1969	data not available			
1970	2,080 a		19,602	25,930
1971	3,815	132	38,016	22,713
1972	3,850	1,497	37,333	13,283
1973	2,161		71,569	25,188
1974	3,117	2,316	35,601	13,813
1975	2,201	1,946	28,291	20,778
1976	2,172	1,815	31,659	34,620
1977	443	1,431	31,796	14,961
1978 b	20 c	1,102	17,292	21,589
1979	c	1,831	8,684	24,984
1980	c	4,231	14,657	31,459
1981	1,035	469	38,206	16,584
1982	1,662	201	15,067 d	25,746 d
1983	c	408 c	18,162	35,322
1984	789	179	27,686	13,076
1985	401	191	23,679	17,595
1986 e	0	18	29,895	9,444
1987 e	5	1,989	24,769	10,922
1988	429	6,733	10,287	23,910

a Includes small numbers of humpback whitefish.
b Also reported taken were 1 chinook, 2 sockeye, 9 chum, and 118 pink salmon.
c No fishing effort during June or July.
d No fishing effort during November or December.
e No fishing effort during July or December.

Average weights: Broad whitefish 5.1 lbs.
Least cisco 0.9 lbs.
Arctic cisco 1.0 lbs.

Appendix Table 43. Commercial freshwater fishery catches, Upper Yukon area, 1971-1988.

	Healy Lake		Lake Minichumina		Tanana River		
	Whitefish		Whitefish		Burbot		Whitefish
Year	Number	Pounds	Number	Pounds	Number	Pounds	Number
1971			3,277	9,831			
1972	2,605	3,950	718	2,154			
1973	2,187	3,915	1,697	5,037			
1974	1,885	3,390	854	2,562			
1975	1,357	2,375					
1976	1,440	2,625					
1977	-	-					
1978	-	-					
1979	1,336	2,306					
1980	data unavailable						
1981	no effort						
1982	no effort						
1983	no effort						
1984	no effort				-	76	
1985	no effort						
1986	no effort						72
1987	no effort						
1988	no effort						837

Appendix Table 44. Commercial freshwater fishery catches, lower Yukon area, 1978-1988.

	Sheefish		Whitefish		Blackfish	Burbot		Pike	Lamprey
Year	Number	Pounds	Number	Pounds	Pounds	Number	Pounds	Pounds	Pounds
1978	-	-	19	87	-	-	-	-	-
1979	5	39	23	55	-	-	-	-	-
1980	283	2,265	78	250	293	-	-	-	-
1981	299	2,812	779	2,875	-	-	-	9	-
1982	754	6,161	1,633	6,214	-	102	482	-	-
1983	395	2,692	163	648	-	-	-	-	-
1984	94	762	794	2,362	-	-	-	-	-
1985	358	3,081	1,514	4,586	-	-	-	-	-
1986	-	-	1,533	5,845	-	-	-	-	80
1987	-	-	2,144	7,564	-	-	-	-	-
1988	-	-	696	2,171	-	-	-	-	-

Attachment 1. List of lower Yukon area emergency orders, 1988.

E.O. Number	Date	Action Taken	Comments
3-LY-01-88	May 23	Established the first Cape Romanzof District commercial herring fishing period beginning 9:00 p.m. May 24 until 3:00 a.m. May 25. Additionally, restricted gear to 50 fathoms per vessel.	Test catch samples and spawning ground surveys indicated an abundance of herring of high roe quality. Due to 100-120 fishing vessels on grounds and increased efficiency of fleet in recent years, gear restriction was warranted.
3-LY-02-88	May 26	Established the second and final Cape Romanzof District commercial herring fishing period beginning 12:00 midnight May 26 until 5:00 a.m. May 26. Additionally, restricted gear to 50 fathoms per vessel.	Test and test commercial catch samples indicated a large abundance of herring with the majority of fish ripe and good quality. Due to commercial catch rates during first fishing period, gear restriction warranted.
3-LY-03-88	June 9	Opened the commercial salmon season effective 6:00 p.m. June 9 in District 1, and 6:00 p.m. June 12 in District 2. Established two - 12 hour fishing periods per week in Districts 1 and 2, with the first period in each district restricted to use of gill nets of six inch or smaller mesh size.	Test fish and subsistence catch rates and sonar enumeration indicated the chum salmon run was of early run timing and of at least average magnitude. Additionally, in consideration of the building trend established in the chinook salmon return, it was warranted to begin the chinook salmon directed season beginning June 13 in District 1 and June 15 in District 2.

E.O. Number	Date	Action Taken	Comments
3-LY-04-88	June 9	Prohibited commercial fishermen from taking salmon for subsistence purposes by gill nets with mesh size larger than six inch maximum mesh size during commercial fishing periods restricted to six inch or smaller mesh size; in District 1 beginning 6:00 p.m. June 9 and in District 2 beginning 6:00 p.m. June 12.	Action taken to prevent chinook salmon harvested under guise of subsistence from entering the commercial market.
3-LY-05-88	June 17	Established special 24-hour subsistence fishing periods every other weekend during the commercial salmon fishing season in Districts 1 and 2. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June 13 until 6:00 p.m. June 19 and from 6:00 p.m. July 2 until 6:00 p.m. July 3 in District 1. In District 2, subsistence fishing opened from 6:00 p.m. June 17 until 6:00 p.m. June 18 and from 6:00 p.m. July 2 until 6:00 p.m. July 3.	Special subsistence fishing periods established by emergency order as stipulated by regulation to provide for increased subsistence fishing opportunity.
3-LY-06-88	June 15	Established special chum salmon directed six hour commercial fishing period from 6:00 a.m. June 15 until 12:00 noon p.m. June 15 in District 1. Additionally, allowed only the use of gill nets of six inch or smaller mesh size.	Fishing period warranted based on coastal commercial harvest rates from period ending 6:00 a.m. June 14, increased test net catches of chum salmon, run timing information, and the fishing schedule which provided reduced fishing time from previous seasons.
3-LY-07-88	June 17	Established special chum salmon directed six hour commercial fishing period from 6:00 a.m. June 17 until 12:00 noon June 17 in District 2.	Fishing period warranted based on an abundance of chum salmon, run timing information, and the schedule which provided for reduced fishing time from previous seasons.

E.O. Number	Date	Action Taken	Comments
3-LY-08-88	June 19	Opened the commercial salmon unrestricted mesh size fishing season effective 6:00 p.m. June 19 in District 3 of the Yukon area. Also established two 12 hour fishing periods a week in District 3.	Test fish and subsistence catch data indicated that chinook salmon were present in harvestable numbers in the lower 300 mile of the river.
3-LY-09-88	June 23	Established gill net mesh size restriction of six inch or smaller mesh size for taking of salmon for commercial purposes beginning June 23 in District 1 and June 26 in District 2.	A switch over to gill nets of six inch maximum mesh size directed the harvest toward summer chum salmon. Additional harvest of chinook salmon was expected in small mesh gear.
3-LY-10-88	June 24	Established special 24-hour subsistence only fishing periods every other weekend during the commercial salmon fishery in District 3. Specifically this emergency order opened subsistence fishing from 6:00 p.m. June 24 until 6:00 p.m. June 25 and from 6:00 p.m. June 8 until 6:00 p.m. June 9.	Special subsistence only fishing period established by emergency order in response to reduced subsistence fishing opportunity due to reduction in allowable commercial fishing time, and in response to reports of subsistence fishermen which indicated they needed more fishing opportunity.
3-LY-11-88	June 26	Established gill net mesh size restriction of six inch or smaller for the taking of salmon for commercial purposes beginning 6:00 p.m. June 26 in District 3. Additionally, closed the commercial salmon fishing season in that portion of District 3 up river of the junction of the main stem Yukon River and the eastern edge of Horse Island.	A switch over to gill nets of six inch maximum mesh size directed commercial harvest toward summer chum salmon downstream of Horse Island. Closure of that portion of District 3 upstream of the eastern edge of Horse Island provided for increased subsistence fishing opportunity beginning 6:00 a.m. June 28.

E.O. Number	Date	Action Taken	Comments
3-LY-12-88	June 26	Prohibited commercial fishermen from taking salmon for subsistence purposes by gill nets with mesh size larger than six inch maximum mesh size during commercial fishing periods restricted to six inch or smaller mesh size in District 3 beginning 6:00 p.m. June 26.	Action taken to prevent chinook salmon harvested under guise of subsistence from entering commercial markets.
3-LY-13-88	July 1	Amended E.O. 3-LY-05-88 to correct the District 2 every other weekend subsistence fishing schedule for the second fishing period to begin 6:00 p.m. July 1 until 6:00 p.m. July 2.	Made legal record of the intended and initially announced subsistence fishing period for District 2.
3-LY-14-88	June 29	Amended scheduled fishing periods for Districts 1 and 2 as described by E.O. 3-LY-03-88 and for District 3 as discribed in 3-LY-08-88 for an increase of 12 hours of commercial fishing time in each district. Additionally, closed that portion of District 3 not previously closed by E.O. 3-LY-11-88 effective 6:00 p.m. June 30.	Increased commercial fishing opportunity with gill nets of six inch and smaller mesh size warranted due to above average strenth of summer chum salmon return. District 3 closed in anticipation of the chinook salmon harvest, following the 24 hour restricted mesh size period, to be within the guideline harvest range. Additionally, closure in response to deterioration of summer chum salmon flesh quality and to provide increased subsistence fishing opportunity.

E.O. Number	Date	Action Taken	Comments
3-LY-15-88	June 26	Amended scheduled fishing periods in Districts 1 and 2 from fishing periods of 24 hour duration as described in E.O. 3-LY-14-88 to fishing periods of 12 hour duration as described in 3-LY-03.88.	Although the summer chum salmon run is above average in strength, it is warranted to reduce fishing time to increase likelihood of increasing escapements to lower Yukon River tributary spawning areas, particularly the east fork Andreafsky River for which spawning area escapements remain 57% below objective.
3-LY-16-88	July 10	Extended closed waters area of the Andreafsky River by moving the west bank Andreafsky River marker one half mile southwestward and downstream to the confluence of the Andreafsky and Yukon Rivers.	Extension of closed water area warranted to enhance summer chum salmon escapements to the Andreafsky River and to avoid waste of unmarketable quality summer chum salmon.
3-LY-17-88	July 14	Closed the commercial fishing season effective 6:00 a.m. July 15 in District 1, and 6:00 a.m. July 14 in District 2.	Season closed in accordance with YUKON RIVER FALL CHUM SALMON MANAGEMENT PLAN to afford increased protection to the early portion of the fall chum salmon return.
3-LY-18-88	August 8	Opened commercial salmon fishery season effective 8:00 p.m. August 8 in District 1, and 10:00 a.m. August 10 in Districts 2 and 3. Also established twice weekly fishing periods, with gill nets of restricted mesh size, of 12 hour duration in the set net only area of District 1, and of six hours duration in the remainder of District 1 and in Districts 2 and 3.	Sonar evaluation, and test and subsistence catch rates indicate a harvestable surplus of fall chum salmon are available.

E.O. Number	Date	Action Taken	Comments
3-LY-19-88	August 12	Established 24 - hour subsistence fishing periods each weekend during the commercial salmon fishing season in Districts 1, 2, and 3.	Regulations require this action for the gill net area of District 1 and District 2. The District 1 set net only area and District 3 were allowed additional subsistence fishing periods in response to a significant reduction in commercial fishing period duration from prior years.
3-LY-20-88	August 11	Amended scheduled fishing periods for Districts 1, 2, and 3. Specifically disallowed fishing periods as follows: in the set net only area of District 1 from 8:00 p.m. August 11 until 8:00 a.m. August 12, in the remainder of District 1 from 10:00 a.m. August 14 to 4:00 p.m. August 14.	Based on harvest to date, sonar enumeration, and test net data it was warranted to delay commercial fishing to assure a great enough portion of this segment of the fall chum salmon run passed through the lower river to provide for spawning area requirements and subsistence needs.
3-LY-21-88	August 15	Amended scheduled fishing periods for District 1. Specifically disallowed fishing periods in the set net only area from 8:00 p.m. August 15 until 8:00 a.m. August 16, and in the set net only area from 10:00 a.m. August 16 to 4:00 p.m. August 16.	Based on harvest to date, sonar enumeration, and test net data it was warranted to delay the District 1 commercial fishing periods. The object of this action was to increase the proportion of coho salmon in the commercial catch and spread the harvest out across the run.
3-LY-22-88	August 22	Closed the commercial salmon fishing season in District 3. Additionally, ammended emergency order 3-LY-18-88 to eliminate the District 2 commercial fishing period scheduled to occur from 10:00 a.m. until 4:00 p.m. Wednesday August 24.	Closed District 3 in response to no commercial fishing effort during August 21 fishing period. District 2 fishing period not allowed to reduce exploitation of fall chum salmon from this segment of the run.

E.O. Number	Date	Action Taken	Comments
3-LY-23-88	August 23	Amended emergency order 3-LY-19-88 to provide for an additional 24 hour subsistence only period in District 2.	In response to fishing periods of reduced length and frequency from previous years.
3-LY-24-88	August 30	Closed Districts 1 and 2 to commercial fishing for the 1988 season.	Fishery closed to ensure that the majority of fall chum salmon spawning area escapement objectives are achieved, that subsistence requirements are met, and that upper Yukon area commercial fisheries have opportunity to achieve commercial harvests of similar proportion toward their respective guidelines.

ATTACHMENT 2. List of Upper Yukon Emergency Orders, 1988.

E.O. Number	Effective Date	Action Taken	Comments
UY-01-88	June 19	Open the commercial fishing season in District 4.	Action taken by the Alaska Board of Fisheries in December 1987 requires that the District 4 commercial fishery be opened by emergency order.
UY-02-88	June 20	Establish commercial season opening dates and fishing period length in Subdistricts 6-A, 6-B and 6-C.	Data from run assessment programs in the Lower Yukon suggest that the 1988 chinook salmon run is weak. In order to help achieve escapement goals, a delay in the opening of the commercial fishing season is warranted.
UY-03-88	July 5	Close the commercial salmon fishing season in Subdistricts 5-A, 5-B and 5-C of District 5.	Cumulative commercial harvest from these subdistricts is estimated to approach the midpoint of the guideline harvest range for these districts. A season closure is therefore appropriate.
UY-04-88	July 14	Close the commercial salmon fishing season in Subdistrict 5-D of District 5.	As of 7/13, the cumulative commercial harvest of chinook salmon is approximately. 300 fish. Based on estimated catch rates, a closure on 7/14 should result in a harvest of approximately 400 chinooks which is the midpoint of the guideline harvest range.

E.O. Number	Effective Date	Action Taken	Comments
UY-05-88	August 1	Close the commercial salmon fishing season in Subdistricts 4-B and 4-C of District 4.	The run of summer chum salmon to these subdistricts was essentially over and adherence to the 1988 management plan required a closure during the early segment of the fall run.
UY-06-88	August 7	Re-open the commercial salmon fishing season in Subdistricts 4-B and 4-C to commercial fishing.	Fall chum salmon counts from the Pilot Station sonar and test and subsistence fishery catches in the Galena and Ruby areas indicate that the run is of sufficient strength for limited commercial harvest.
UY-07-88	August 18	Open the commercial salmon fishing season in Subdistricts 5-A, 5-B and 5-C for two 24-hour fishing periods on August 18 and August 20.	Evaluation of available data suggests that the fall run is of average strength and able to support commercial removal.
UY-08-88	August 30	Close the commercial fishery season in Subdistricts 4-B and 4-C of District 4.	It is projected that a closure of these areas to commercial fishing on August 30 would result in a cumulative harvest of approximately 13,000 to 15,000 fall run chum salmon. This level of harvest is thought to be commensurate with run strength.

E.O. Number	Effective Date	Action Taken	Comments
UY-09-88	September 9	Open the commercial fishery season in District 6 for one 24-hour period.	Reliable estimates of fall chum and coho run strength are not available. Test and subsistence catches indicate that the fall run is well distributed and is sufficiently large to warrant a test opening.
UY-10-88	September 9	Open Subdistrict 5-D of District 5.	Based on available run timing data, the fall chum run is now well distributed throughout the upper portion of District 5 and an opening of the commercial fishing season is therefore warranted.
UY-11-88	September 12	Open the Tanana River for a second 24-hour fishing period.	Current year fall chum and coho runs appear to be of average strength. The harvest level anticipated in an additional period will not jeopardize spawning on escapement requirements.
UY-12-88	September 14	Close the commercial salmon fishery season in Subdistrict 5-D of District 5.	As of September 13, the estimated cumulative commercial fall chum salmon catch for Subdistrict 5-D is 1,700 fish. This approaches the upper end of the (reduced) guideline harvest range and a closure is therefore required.
UY-13-88	September 20	Open the commercial fishery season in District 6 for a third 24-hour period.	Fall chum run essentially over but coho salmon remain abundant.

E.O. Number	Effective Date	Action Taken	Comments
UY-14-88	September 30	Increase fishing time in the District 5 subsistence and personal-use fisheries.	The fall chum run was early, however, many Tanana River fishermen do not fish until late September/early October. Given the subsistence priority and the current strong run of coho salmon, a relaxation of the current fishing schedule is justified.

Attachment 3. Summary of Yukon area regulations adopted by the Alaska Board of Fisheries during December 1987 and May 1988 hearings.

Regulations

Section	Commercial Fishing
5AAC 05.331	Establish for all districts a maximum allowable gill net depth of 60 meshes for nets with mesh exceeding six inches and 70 meshes for nets of six inch or smaller mesh.
5AAC 05.310	Establish the opening of the commercial salmon fishing season in District 4 by emergency order between June 10 and June 25.
5AAC 05.367	Establish June 20 and August 10 as opening date and closing date of the commercial salmon fishery season in District 6. Establish two 42-hour periods per week for commercial fishing during the early season in District 6; during the fall season, there may be no more than one commercial 42-hour period per week.
5AAC 05.375	Require a permit of salmon processors in District 6.
5AAC 27.060	Provides directives in addition to regulations which govern individual fisheries and identifies the threshold of which minimum biomass levels for each herring fishing district. The threshold for Cape Romanzof District is 1,500 st.
5AAC 27.931	In Cape Romanzof herring fishery, establish emergency order authority to restrict herring gill nets to no more than 50 fathoms and prohibit possession of gear in excess of the legal limit aboard vessels during open commercial fishery periods. Prohibit the use of mechanical devices to shake or dislodge herring from a gill net.

5AAC 01.010 METHODS, MEANS, and GENERAL RESTRICTIONS	Effective 1/1/89 gill net web must be met one of the following requirements: 1) the web must contain at least 30 filaments and all filaments must be of equal diameter, or 2) the web must contain at least six filaments each of which must be at least 0.20 millimeters in diameter.

Subsistence Fishery

5AAC 01.210.(b)(3)	Amend to allow 7 days per week subsistence fishing in subdistrict 5-D.
5AAC 01.220.(f)(i)	Halibut may be taken only by a single hand held line with no more than three hooks attached.
5AAC 05.230	Require a subsistence fishing permit in Subdistricts 6-A and 6-B of District 6 and establish report requirements.
5AAC 01.235	Only those residents domiciled in rural locations in the Yukon Area, as determined by the joint Boards of Fisheries and Game under 5AAC 99, and the community of Stebbins may take salmon and freshwater species including sheefish, whitefish, lamprey, burbot, sucker, grayling, pike, char, and blackfish, in the Yukon Area Only those residents domiciled within 20 miles of the coast between the terminus of the Black River and the westernmost point of the Niskonat Peninsula may take herring and herring roe in the location.

Personal Use Fishery

5AAC 77.170	Salmon may be taken for personal use in accordance with subsistence salmon fishing regulations. Establish that permits are required for taking salmon for personal use.
5AAC 77.180 PERSONAL USE HERRING FISHERY	Establish that herring and personal use herring may be taken for personal use in accordance with the subsistence herring fishery regulations in 5AAC 01.210 - 5AAC 01.230.

Attachment 4. Summary of special projects conducted in the Yukon Area, 1988.

1. LOWER YUKON TEST FISHING

a. Location:

1) Big Eddy Set Net Test Fishing Project: Kwikluak Pass near Emmonak (south mouth of the Yukon River Delta).

2) Middle Mouth Set Net Test Fishing Project: Kawanak and Apoon Passes middle and north mouths of Yukon River Delta).

3) Big Eddy Drift Test Fishing Project: Kwikuak pass near Emmonak (south mouth of the Yukon River Delta).

b. Objectives: To determine run timing, distribution and relative abundance of chinook, summer chum, fall chum and coho salmon in the lower Yukon River using gill nets.

c. Results:

1) Big Eddy Set Net Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated from May 27 to July 15. A total of 2,014 chinook and 5,466 summer chum salmon were captured. There was a much larger than usual catch of chinook salmon in 5.5-inch mesh gill nets. The mean date (the date on which statistically the central portion of the migration passed the test fishery) for chinook salmon and summer chum salmon was June 20 and June 18, respectively. Relative abundance of summer chum salmon was similar to 1985.

b) FALL CHUM AND COHO SALMON: Index set nets for fall chum and coho salmon were operated from July 16 until September 1. A total of 788 fall chum and 778 coho salmon were caught. Fall chum salmon catches decreased substantially from 1986 and 1987 levels and were similar to 1984. Fall chum run timing was earlier than 1987. Coho salmon catches were larger than 1986 and 1987. Test fishing data indicated mean dates of August 4 and August 16 for fall chum and coho salmon, respectively.

2) Middle Mouth Test Fishing Project:

a) CHINOOK AND SUMMER CHUM SALMON: Index set nets for chinook and summer chum salmon were operated June 1 until July 15. A total of 1,103 chinook and 3,334 summer chum salmon were captured. Chinook salmon catches were lower than 1986 and 1987. The mean date of

migration was June 18. Summer chum salmon catches were above recent year's (1985-1987) catches. The mean date of migration for summer chum salmon was June 26.

b) FALL CHUM AND COHO SALMON: Three index set nets for fall chum and coho salmon were fished from July 16 until September 1. A total of 2,678 fall chum and 1,501 coho salmon were captured. Fall chum salmon catches were similar to 1987. The coho salmon catch increased significantly over 1985-1987. The mean dates of migration were calculated to be August 6 and August 20 for fall chum and coho salmon, respectively.

3) BIG EDDY DRIFT TEST FISHING PROJECT:

Drift test fishing for chinook salmon was conducted for the second season in 1988. Two stations were established, one on each side of Kwikluak Pass upriver from the set net sites at Big Eddy. One drift was made at each station at approximately high tide. Data was collected from June 1 through July 7. A total of 432 chinook and 1,084 summer chum salmon were captured in a total of 136 drifts. Chinook salmon catches were significantly lower than 1987, whereas summer chum salmon catches were three times as large.

There did not appear to be a good relationship between drift and set net CPUE. It was difficult to interpolate data for drifts missed during commercial fishing periods. Both projects indicated similar run timing for chinook salmon.

2. UPPER YUKON RIVER TEST FISHING

a. Location:

1) North bank of Yukon River approximately 21 miles upstream from Ruby.

2) A total of four test fish wheel sites on the Tanana River; one site on the north bank near Manley; two sites near Nenana; one site near Fairbanks.

b. Objectives: To determine run timing and relative abundance of fall chum and coho salmon.

c. Results:

1) The Ruby area north bank test fish wheel was run from July 31 through September 10. During this time, a cumulative total of 3,528 chum salmon was caught; the timing was bimodal with peaks occurring during the periods August 9-14 and August 22-30.

2) The test fish wheel near Manley was operated from August 13 through September 27. During this time, a cumulative total of 9,965 chum and 2,564 coho salmon were caught. The fall chum salmon run peaked during the period September 2-9. The coho salmon run peaked during the period September 3-11.

The test fish wheels near Nenana were operated from August 23 through September 30. During this time, a cumulative total (both sites combined) of 12,717 chum and 10,518 coho salmon were caught. The fall chum salmon run peaked during the period September 4-8. The coho salmon run peaked during the period September 13-16.

The test fish wheel near Fairbanks was operated from September 1 through September 30. During this time, a cumulative total of 5,901 chum and 2,573 coho salmon were caught. The fall chum salmon run peaked from September 6-14; the coho salmon run peaked during September 22-23.

3. YUKON RIVER SONAR

a. Location: River mile 123, approximately one mile upstream of Pilot Station.

b. Objectives: The primary objective of this project is to hydroacoustically estimate the number of salmon, by species, passing river mile 123.

c. Results: Sonar was operational on both banks of the Yukon River between June 2 and September 14 in 1988. Fish counts totaled 3,401,201 of which 77% were detected migrating along the south shore and 23% were detected along the north shore of the river. Four mesh sizes of gill net were fished throughout the season to give data for development of species composition estimates. Preliminary results indicate passage of 80,834 chinook salmon, 1,875,880 summer chum salmon, 506,993 fall chum salmon, 263,887 coho salmon, and 536,312 pink salmon. Apportioned counts for other species (primarily whitefish, burbot, and sheefish) are not available.

4. SUBSISTENCE SALMON FISHERY SURVEYS

a. Location: Yukon, Koyukuk and Tanana Rivers, Yukon Territory villages, and Yukon River Delta coastal communities.

b. Objectives: Determine subsistence utilization of salmon and fishing effort needed for formulating future management procedures and goals.

c. Results: An estimated 1,304 fishing families in the Yukon River drainage harvested an estimated total of 54,150 chinook, 202,137 summer chum, 163,005 fall chum, and 69,138 coho salmon. Catch and effort information was obtained by personal interviews and catch questionnaires. Yukon Territory subsistence catch data was

furnished by Government of Canada-Department of Fisheries and Oceans (Whitehorse); number of households interviewed in the Canadian portion of the drainage is not available.

5. COMMERCIAL AND SUBSISTENCE SALMON CATCH SAMPLING

a. Location: Emmonak, St Marys, Marshall, Galena, Rampart, Nenana, and Fairbanks.

b. Objectives: Obtain age, sex, and size composition estimates for salmon harvests in the major commercial and subsistence fisheries on an in-season and post-season basis. Also, provide scale samples of chinook and chum salmon to the stock identification research projects for catch allocation of these species to stock of origin based on scale patterns analysis.

c. Results: Approximately 5,100 chinook salmon, 5,100 summer chum salmon, and 4,000 fall chum salmon and 1,000 coho salmon were sampled from fishery harvests in 1988. Preliminary age and sex composition estimates for the lower river commercial fishery were obtained on an in-season basis for harvest regulation purposes. Samples from upper river fisheries were aged on a post-season basis. Overall age compositions by species were as follows:

1) Chinook salmon: 0.1% age 3, 14.8% age 4, 22.8% age 5, 31.5% age 6, 29.4% age 7, and 1.4% age 8 fish.
2) Summer chum salmon: 70.1% age 4, 29.1% age 5, and 0.8% age 6 fish.
3) Fall chum salmon: 4.1% age 3, 45.7% age 4, 46.6% age 5, and 3.5% age 6 fish.
4) Coho salmon: 12.2% age 3, 85.5% age 4, and 2.3% age 5 fish.

6. CHINOOK SALMON STOCK BIOLOGY

a. Location: Commercial and subsistence fishery catch samples were obtained from Districts 1, 2, 4, 5, and 6, and test fishery catch samples were obtained from District 1 as outlined in catch sampling and test fishing project summaries. Escapement carcass samples were collected from the Andreafsky, Anvik, Nulato, Gisasa, Chena, and Salcha Rivers in Alaska, and from the Nisutlin, Big Salmon, Little Salmon, Tatchun (Creek), Takhini, Ross, and mainstem Yukon Rivers in Yukon Territory. Samples were primarily collected from carcasses. However, some samples were obtained from live fish captured for a genetic stock identification (GSI) study conducted by the U.S. Fish & Wildlife Service (USFWS). Additional catch and escapement samples from the Yukon Territory were provided by the Canadian Department of Fisheries and Oceans (DFO)

b. Objectives: Allocate Yukon River commercial and subsistence chinook salmon harvests to stock region of origin by fishing district and

time period based on scale patterns analysis. Assess the quality of spawning escapements relating to potential productivity, and monitor the effects of harvest management strategy on spawning escapements by stock.

c. Results: All escapement samples, and catch samples not aged during the season, were aged on a post-season basis. Age, sex, and size composition data are compiled, and are preliminary. Scale patterns from approximately 2,000 chinook salmon catch and escapement samples were analyzed using a computer based digitizing station. These scale measurements will be used to build stock identification models for allocation of the Yukon River fishery harvests to stock region of origin.

7. ANDREAFSKY RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 20 of the East Fork Andreafsky river.

b. Objectives: Enumerate summer chum, chinook, and pink salmon escapement to the East Fork Andreafsky River on a daily basis by visually counting fish passage from a counting tower. Collect adult chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples were collected by carcass survey under the Chinook Salmon Stock Biology Project. Collect and Preserve juvenile chinook salmon for use in a stock identification study based on parasite load and type.

c. Results: Salmon escapement counting was conducted from June 21 through July 26. The season total escapement estimates were 68,937 summer chum, 1,339 chinook, and 295,723 pink salmon. The summer chum salmon estimate was the second smallest total season count recorded for this stream since the study was initiated in 1981. This estimate was 43% below the previous long term (1981-1987, excluding 1985) average total season count of 120,400 fish. The chinook salmon escapement was the smallest total season count (sonar and tower counts) recorded for this river during the period 1981-1988, excluding 1982 and 1985. Chinook salmon count data was unavailable in 1982 and 1985. However, the 1988 total season count was within the aerial survey objective of 1,100 to 1,600 fish for this river. Pink salmon are more abundant in even years. The 1988 pink salmon estimate was approximately 137% above the 1986 estimate.

Chum salmon age composition for 525 ageable samples was 70% age 4, 26% age 5, 3% age 6, and 16% age 7 fish. Females accounted for 49% of the sample. Chinook salmon age composition for 403 ageable samples was 30% age 5, 28% age 4, 27% age 6, and 16% age 7 fish. Females accounted for 39% of the sample.

At least 50 juvenile chinook salmon were captured and preserved for later examination.

8. ANVIK RIVER SALMON ESCAPEMENT STUDY

a. Location: River mile 48 of the Anvik River.

b. Objectives: Enumerate summer chum salmon escapement to the Anvik River on a daily basis using side-scanning sonar. Collect adult chum and chinook salmon samples by beach seine for age, sex, and size composition estimates. Additional chinook salmon samples are collected by carcass survey under the Chinook Salmon Stock Biology Project. Collect juvenile chinook salmon for use in a stock separation study based on parasite load and type. Collect adult chum salmon tissue samples for use in a stock separation study of Yukon River chum salmon stocks based on biochemical genetic differentiation.

c. Results: Salmon escapement counting was conducted from June 21 through July 27. The season total escapement estimate was 1,125,449 summer chum salmon. This estimate was 26% greater than the parent year escapement in 1984, and was 131% above the escapement objective of 487,000 fish, and was also 82% above the long term (1972-1987) average escapement of 617,000 fish.

Chum salmon age composition for 531 ageable samples was 77% age 4, 16% age 5, 6% age 3, and 1% age 6. Females accounted for 66% of the sample. Chinook salmon age composition for 246 ageable samples was 38% age 5, 30% age 4, 27% age 6, and 4% age 7. Females accounted for 30% of the sample.

At least 50 juvenile chinook salmon were captured and preserved for later examination for parasite load and type. Heart, liver, muscle, and eye tissue samples were collected and frozen from 100 summer chum salmon for electrophoretic analysis.

9. SHEENJEK RIVER ESCAPEMENT STUDY

a. Location: River mile 6 of the Sheenjek River (Porcupine River drainage).

b. Objectives: Determine timing and magnitude of salmon escapement to the Sheenjek River and collect salmon age, sex, and size information from a sampled portion of the run.

c. Results: The sonar-estimated escapement to the Sheenjek River in 1988 was 41,073 fall chum salmon for the period August 21 through September 27. The mean date of run passage was September 5.

Chum salmon age composition for 120 ageable samples was 2.5% age 3, 68.3% age 4, and 29.2% age 5. Females accounted for 81.7% of the sample. Samples were obtained by beach seine from September 20-25.

10. CHANDALAR RIVER ESCAPEMENT STUDY

(Conducted by U.S. Fish and Wildlife Service)

a. Location: River mile 13 of the Chandalar River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river, locate primary spawning areas through radio telemetry, and collect salmon age, sex, and size information.

c. Results: The sonar-estimated escapement to the Chandalar River in 1988 was 33,619 fall chum salmon for the period August 11 through September 24. Mean date of run passage was September 4. Sonar counts during the last 24 hours of operation suggest significant fall chum passage after project termination.

11. DELTA RIVER ESCAPEMENT STUDY

a. Location: Lower mile of the Delta River.

b. Objectives: Determine timing and magnitude of salmon escapement to this river and collect salmon age, sex, and size information.

c. Results: A total season population estimate of 18,024 fall chum salmon was made for this river in 1988. The population estimate was generated from replicate foot surveys, conducted in October and November, in conjunction with the Delta River time density model developed in 1985.

Chum salmon age composition for 150 ageable samples was 59.3% age 4, 38.0% age 5, 2.0% age 3, and 0.7% age 6 fish. Females accounted for 54.7% of the sample. Samples were obtained from carcasses on November 19.

12. CHENA RIVER CHINOOK SALMON STUDY

a. Location: Chena River (Tanana River drainage).

b. Objectives: Determine the timing and magnitude of chinook salmon escapement to the Chena River and estimate the proportion of the spawning population observed by a peak aerial census. Estimate the age, sex, and size composition of the chinook salmon escapement.

c. Results: Gill nets were fished at river mile 16 to collect chinook salmon for tagging. A total of 254 gill net caught chinook salmon was tagged, fin-clipped and released during the period July 5-25. In addition, 128 chinook salmon caught by electro-shocking were tagged, fin-clipped, and released. Eighty-two marked fish were subsequently recovered (July 29 through August 12) on the spawning grounds from a total of 1,018 fish and carcasses examined. Tag loss was estimated to be 20%.

It was found when using gill net data that probabilities of recapture were not constant over the period of release, thus a

Petersen population estimate could not be made. Further, approximately 15 different models were examined, using stratified population estimators, but without success. It was not possible to estimate population size with the gill net data. Ten additional models were also examined by pooling the electro-shocking data with the gill net data; again, without success.

Overall mean timing of the chinook salmon run in the Chena River was estimated to be July 17 with 50% run passage estimated on July 18. A slight difference in timing by sex was observed.

The chinook salmon spawning population was composed of 6 age groups from 6 brood years. Females were dominated by age group 1.4 (36%) and 1.5 (21%), whereas, males were predominantly represented by age groups 1.2 (11%), 1.3 (14%), and 1.4 (11%). The chinook salmon escapement male-to-female ratio was estimated at 1.00:1.56.

13. SALCHA RIVER ESCAPEMENT STUDY

a. Location: The lower 60 miles of the river, up to the confluence with Caribou Creek.

b. Objective: Determine what portion of the total spawner abundance, estimated using a mark-and-recapture experiment, of chinook salmon was observed during an aerial survey of the Salcha River in 1988. Specific objectives included:

1) estimate the abundance of the population of spawning chinook salmon in the Salcha River using mark-and-recapture experiments;

2) estimate the proportion of the total escapement of chinook salmon in the Salcha River represented by a point estimate from an aerial survey during peak spawning; and,

3) estimate the age, sex, and size composition and total fecundity of chinook salmon in the Salcha River.

c. Results: Four hundred fifty-nine adult chinook salmon were captured, measured, tagged, fin-clipped, and released from July 26 through August 2 using electro-fishing gear. Four chinook salmon were killed during the capture event. Eight hundred seventy-three carcasses were collected and examined for tags and fin clip from August 3-5. Ninety-two of these fish were marked.

The distribution of the lengths of the population was bimodal. The estimate of abundance was 4,562 (standard error = 556). The estimate of the number of females and males were 1,525 (standard error = 197) and 3,037 (standard error = 229), respectively. The peak count of chinook salmon from a fixed-wing aircraft was 2,761, approximately 61% of the mark-recapture point estimate. The estimate of egg production for the 1988 spawning run was 16.2 million eggs (standard error = 2.8 million).

14. TANANA RIVER FALL CHUM STUDIES

a. Location: Tanana River, upriver from the test fish wheel site near Fairbanks.

b. Objectives: Document previously unknown spawning grounds for fall chum salmon in the Tanana River drainage upriver of Fairbanks.

c. Results: A total of seventy-three low frequency tags and five high frequency tags were released at the test fish wheel site near Fairbanks. Two tags were recovered during the fishery. A survey flown on October 27 located 71 tags. A total of 14 surveys were conducted. The most significant finding of the study was that all tagged fish went to know spawning areas.

15. CAPE ROMANZOF HERRING PROJECT

a. Location: Kokechik Bay and Scammon Bay.

b. Objectives: Determine distribution, timing and relative abundance of spawning herring and collect information on spawn deposition. Collect age, sex and size composition, fecundity data and relative maturity information of herring from test fishing and commercial catches.

c. Results: The herring biomass was estimated to be approximately 6,600 st based evaluation of herring spawn deposition, test fishing data, and age composition data from test and commercial catches. An aerial survey biomass estimate was not possible due to turbid water conditions. Department test fishing was conducted from May 20 to June 5. A total of 1,027 herring was sampled from test variable mesh and commercial gill nets. Approximately 53% of the total biomass was composed of age 8 and older Pacific herring. Ground surveys indicated primary spawn deposition occurred from May 19 until termination of the project, with the majority of spawn deposited from May 24 to May 28. A quantitative spawn deposition study was conducted; results are not yet available.